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No. 2306

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United States  
**Circuit Court of Appeals**  
For the Ninth Circuit.

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SHERMAN-CLAY & COMPANY,  
a Corporation,  
Plaintiff in Error,

vs.

SEARCHLIGHT HORN COMPANY,  
a Corporation,  
Defendant in Error.

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**Book of Exhibits.**

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Upon Writ of Error to the United States District Court  
for the Northern District of California,  
Second Division.

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## INDEX TO EXHIBITS.

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	Page
Plaintiff's Exhibit No. 1—Letters Patent No. 771,441, to P. C. Nielsen, Patented October 4, 1904.....	1
Defendant's Exhibit "A"—Letters Patent No. 72,422, to George S. Saxton, Patented December 17, 1867.....	7
Defendant's Exhibit "B"—Letters Patent No. 8824, to Frederick S. Shirley, Patented December 7, 1875.....	10
Defendant's Exhibit "C"—Letters Patent No. 693,460, to S. Takaba, Patented February 18, 1902.....	13
Defendant's Exhibit "D"—Letters Patent No. 10,235, to E. Cairns, Patented September 11, 1877.....	17
Defendant's Exhibit "E"—Letters Patent No. 165,912, to W. H. Barnard, Patented July 27, 1875.....	20
Defendant's Exhibit "F"—Letters Patent No. 181,159, to C. W. Fallows, Patented August 15, 1876.....	23
Defendant's Exhibit "G"—Letters Patent No. 409,196, to C. L. Hart, Patented August 20, 1889.....	26
Defendant's Exhibit "H"—Letters Patent No. 406,332, to J. C. Bayles, Patented July 2, 1889.....	30
Defendant's Exhibit "I"—Letters Patent No.	

Index.	Page
34,907, to C. McVeety and J. F. Ford, Patented August 6, 1901.....	34
Defendant's Exhibit "J"—Letters Patent No. 612,639, to J. Clayton, Patented October 18, 1898.....	37
Defendant's Exhibit "K"—Letters Patent No. 651,368, to J. Lanz, Patented June 12, 1900.	40
Defendant's Exhibit "L"—Letters Patent No. 705,126, to G. Osten and W. P. Spalding, Patented July 22, 1902.....	44
Defendant's Exhibit "M"—Letters Patent No. 648,994, to M. D. Porter, Patented May 8, 1900.....	48
Defendant's Exhibit "N"—Letters Patent No. 699,928, to C. McVeety and J. F. Ford, Patented May 13, 1902.....	53
Defendant's Exhibit "O"—Letters Patent No. 739,954, to G. H. Villy, Patented September 29, 1903.....	56
Defendant's Exhibit "P"—Letters Patent No. 7594, to William Phillips Thompson, Patented April 24, 1900.....	62
Defendant's Exhibit "Q"—British Letters Patent No. 20,567, to John Mesny Tourtel, Patented September 20, 1902.....	72
Defendant's Exhibit "R"—British Letters Patent No. 17,786, to Henry Fairbrother, Patented August 13, 1902.....	79
Defendant's Exhibit "S"—Letters Patent No. 771,441, to Peter C. Nielsen, Patented October 4, 1904.....	87



[Plaintiff's Exhibit No. 1—Letters Patent No. 771,441 to P. C. Nielsen, Patented October 4, 1904.]

No. 771,441.

THE UNITED STATES OF AMERICA.

To All to Whom These Presents shall Come:

Whereas Peter C. Nielsen, of Greenpoint, New York, has presented to the Commissioner of Patents a petition praying for the grant of Letters Patent for an alleged new and useful improvement in

Horns for Phonographs or Similar Machines, a description of which invention is contained in the specification of which a copy is hereunto annexed and made a part hereof, and has complied with the various requirements of Law in such cases made and provided, and

Whereas upon due examination made the said Claimant is adjudged to be justly entitled to a patent under the Law.

Now therefore these Letters Patent are to grant unto the said Peter C. Nielsen, his heirs or assigns for the term of Seventeen years from the fourth day of October, one thousand nine hundred and four, the exclusive right to make, use and vend the said invention throughout the United States and the Territories thereof.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington this fourth day of October, in the year of our Lord one thousand nine hundred and four, and of the Independence of the United States of America the one hundred and twenty-ninth.

[Seal]

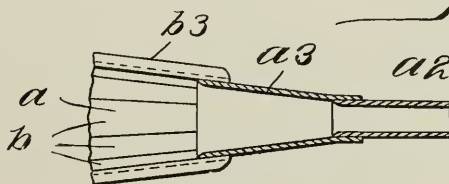
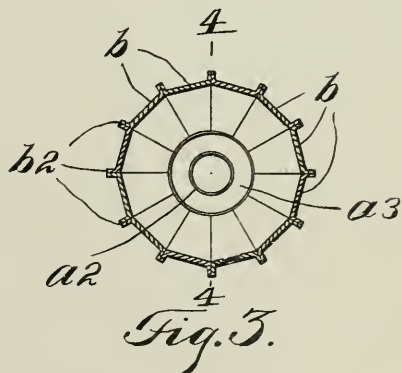
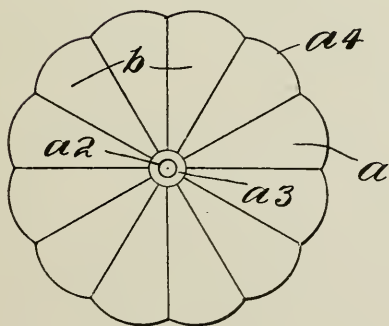
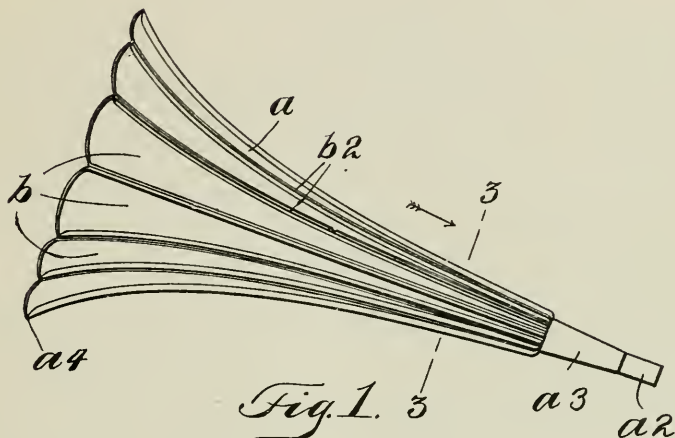
F. I. ALLEN,  
Commissioner of Patents.

P. C. NIELSEN.

HORN FOR PHONOGRAPHS OR SIMILAR MACHINES.

APPLICATION FILED APR. 14, 1904.

NO MODEL.



WITNESSES

*W. B. Mattingly*  
*F. A. Stewart*

*Fig. 4.*

BY

INVENTOR

*Peter C. Nielsen,*  
*Edgar & Co*

ATTORNEYS



PETER C. NIELSEN, OF GREENPOINT, NEW YORK.

## HORN FOR PHONOGRAPHS OR SIMILAR MACHINES.

SPECIFICATION forming part of Letters Patent No. 771,441, dated October 4, 1904.

Application filed April 14, 1904. Serial No. 203,080. (No model.)

*To all whom it may concern:*

Be it known that I, PETER C. NIELSEN, a citizen of the United States, residing at Greenpoint, in the county of Kings and State of New York, have invented certain new and useful Improvements in Horns for Phonographs or Similar Machines, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to the horn of a phonograph or other machine of this class; and the object thereof is to provide a horn for machines of this class which will do away with the mechanical, vibratory, and metallic sound usually produced in the operation of such machines, and also produce a full, even, and continuous volume of sound in which the articulation is clear, full, and distinct.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which—

Figure 1 is a side view of my improved phonograph-horn; Fig. 2, an end view thereof; Fig. 3, an enlarged section on the line 3 3 of Fig. 1, and Fig. 4 a longitudinal section on the line 4 4 of Fig. 3.

In the practice of my invention I provide a horn *a*, provided at its smaller end with the usual nozzle-piece *a'*, by means of which connection is made with the machine, and in the form of construction shown a supplemental piece *a''* is employed between the larger or body portion of the horn and the nozzle-piece *a'*; but the parts *a''* and *a'* may be formed integrally, if desired, and may be constructed in any desired manner. The main part *a* of the horn is bell-shaped in form and tapers outwardly gradually from the part *a'* to the larger or mouth end *a''*, and this curve or taper is greater or more abrupt adjacent to said larger or mouth end. The body portion of the horn is also composed of a plurality of longitudinal strips *b*, which are gradually tapered from one end to the other, and which are connected longitudinally, so as to form longitudinal ribs *b'*, each of the strips *b* being provided at

its opposite edges with a flange *b''*, and these flanges of the separate strips *b* are connected to form the ribs *b'*. The body portion of the horn or the strips *b* are composed of sheet metal, and it will be observed that the inner wall of the body portion of said horn in cross-section is made up of a plurality of short lines forming substantially a circle, and it is the construction of the body portion of the horn as hereinbefore described that gives thereto the qualities which it is the objects of this invention to produce, which objects are the result of the formation of the horn or the body portion thereof of longitudinal strips *b* and providing the outer surface thereof with the longitudinal ribs *b'* and curving the body portion of the horn in the manner described. If desired, the part *a''* may be formed integrally with the body portion of the horn, in which event the ribs *b'* would extend to the nozzle or connecting portion *a'*, and it is the longitudinal ribs *b'* which contribute mostly to the successful operation of the horn, said ribs serving to do away with the vibratory character of horns of this class as usually made and doing away with the metallic sound produced in the operation thereof.

My improved horn may be used in connection with phonographs or other machines of this class, and changes in and modifications of the construction described may be made without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A horn for phonographs and similar machines, the body portion of which is composed of longitudinally-arranged strips of metal provided at their edges with longitudinal outwardly-directed flanges whereby said strips are connected and whereby, the body portion of the horn is provided on the outside thereof with longitudinally-arranged ribs, substantially as shown and described.

2. A horn for phonographs and similar machines, the body portion of which is composed of longitudinally-arranged strips of metal provided at their edges with longitudinal outwardly-directed flanges whereby said strips

are connected and whereby, the body portion of the horn is provided on the outside thereof with longitudinally-arranged ribs, said strips being tapered from one end of said horn to the  
5 other, substantially as shown and described.

3. A horn for phonographs and similar instruments, said horn being larger at one end than at the other and tapered in the usual manner, said horn being composed of longitudinally-arranged strips secured together at  
10 their edges and the outer side thereof at the

points where said strips are secured together being provided with longitudinal ribs, substantially as shown and described.

In testimony that I claim the foregoing as  
my invention I have signed my name, in presence of the subscribing witnesses, this 13th  
day of April, 1904.

PETER C. NIELSEN.

Witnesses:

F. A. STEWART,  
C. J. KLEIN.



[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Pltffs. Exhibit 1. Oct. 1, '12. W. B. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Plaintiff's Exhibit 1. Received Aug. 19, 1913. F. D. Monckton, Clerk.



[Defendant's Exhibit "A"—Letters Patent No. 72,422, to George S. Saxton, Patented December 17, 1867.]

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "A." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "A." Received Aug. 19, 1913. F. D. Monckton, Clerk.



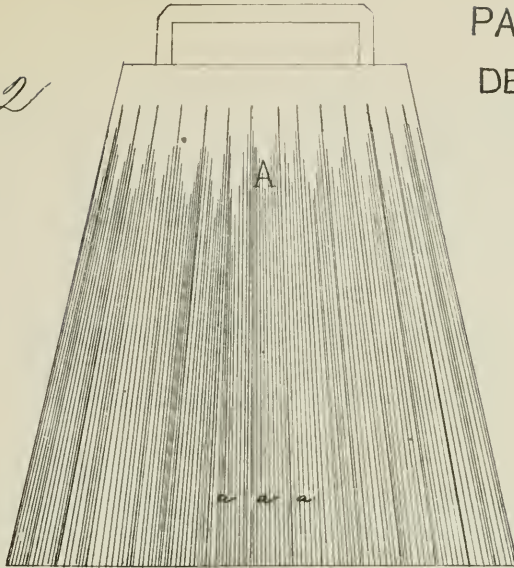
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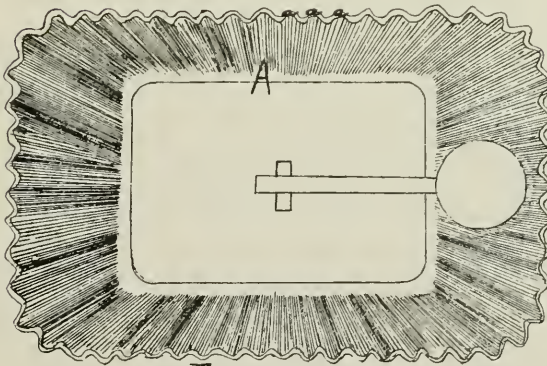
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*No. 72,422*

72422



*Figure.1*



*Figure.2*

*Witnesses*

*E. C. White*

*J. L. des Granges*

*Inventor*

*E. S. Saxton*

*By his Atty.*

*W. Randolph & Co.*



# United States Patent Office.

GEORGE S. SAXTON, OF ST. LOUIS, MISSOURI.

*Letters Patent No. 72,422, dated December 17, 1867.*

## IMPROVEMENT IN MANUFACTURE OF CORRUGATED BELLS.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE S. SAXTON, of the city and county of St. Louis, and State of Missouri, have invented a new and useful Improvement in Bells; and I do hereby declare that the following is a full and clear description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention relates to an improvement in bells by corrugating the lower portion of their sides or bodies; the object of which improvement is twofold in its nature: Firstly, it is for the purpose of increasing the tintinabulary quality of the bell, and the volume of the sound issued therefrom; and, secondly, it is for the purpose of constructing small bells of sheet metal, and of one single piece, the corrugations of the sides of the bell taking up the excess of the metal toward the base, and thus rendering it possible to form a perfect pressed bell of one single piece.

To enable those skilled in the art to make and use my improved bell, I will proceed to describe its construction and operation.

Figure 1 of the drawings is a side elevation of one of the improved bells.

Figure 2 is a bottom plan of the same:

The general form of the bell A may be in any pattern that is best adapted to the purposes for which it is intended. The only feature in which it differs from all other bells is in the corrugations *a*, which commence in large folds near or at the bottom of the bell, and, as they rise, gradually diminish toward the top, at which place they entirely vanish. These folds or corrugations *a* increase the lower or vibratory portion of the bell to such an extent as to very perceptibly increase the volume of sound produced by its agitation. The chief object of the improvement, however, is to form the bell in such a manner that it may be constructed by pressing, with suitable dies, a single sheet of metal into the proper form. This of course is confined to small bells, and the result is to produce a better bell at a cheaper price. The depth of the bell of course precludes the idea of pressing a bell into the proper form without taking up the excess of metal in this manner.

Having described my invention, I claim as a new article of manufacture—

The bell A, when it is formed in corrugations, substantially in the manner and for the purpose set forth.

GEO. S. SAXTON.

Witnesses:

M. RANDOLPH,  
T. E. WHITE.



**Defendant's Exhibit "B"**—Letters Patent No. 8824,  
to Frederick S. Shirley, Patented December 7,  
1875.

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor.  
Dist. of Cal. Dfts. Exhibit "B." Oct. 2, '12. M.,  
Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the  
Ninth Circuit. Defendant's Exhibit "B." Re-  
ceived Aug. 19, 1913. F. D. Monekton, Clerk.



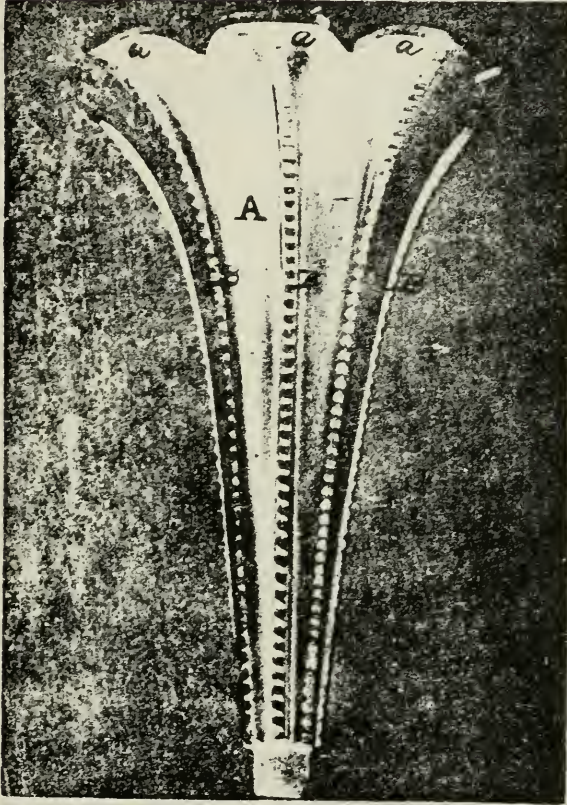


F. S. SHIRLEY.

GLASSWARE.

No. 8,824.

Patented Dec. 7, 1875.



Witnesses:  
*Fred Brown*  
*B. E. Clark*

Inventor:  
*Frederick S. Shirley*  
 By *Wm. H. H.*  
*His Attys.*



# UNITED STATES PATENT OFFICE.

FREDERICK S. SHIRLEY, OF NEW BEDFORD, MASSACHUSETTS.

## DESIGN FOR GLASSWARE.

Specification forming part of Design No. 8,824, dated December 7, 1875; application filed November 24, 1875.

[Term of Patent  $3\frac{1}{4}$  years.]

### *To all whom it may concern:*

Be it known that I, FREDERICK S. SHIRLEY, of New Bedford, Bristol county, in the State of Massachusetts, have invented a Design for Glass-Vase Bodies, of which the following is a specification:

The nature of my design is fully shown in the accompanying photographic illustration, to which reference is made.

A is the glass-vase body, made of an elongated bell shape, or like a flaring cone, and finished at its mouth or upper edge with flaring curved lips or scallops, as shown at *a*. The exterior surface of this vase-body is ground off to produce a lusterless appearance. B B are ribs, which extend from the line of the base up along the exterior surface of the vase-body to the upper edge or mouth, terminating there, one at the center of each of the flaring lips or scallops. These ribs are nicked or serrated throughout their entire length, and are highly polished.

This glass-vase body is intended to be mounted on a standard or base of metal or other material.

I prefer to use clear or colorless glass for the body, but either the surface of the vase or the ribs, or both, may be colored; but I do not consider the coloring to be an essential element in my design.

I am aware that glass vases having a bell or cone shape, and with flaring scalloped lips and longitudinal ribs, are not new, and I do not claim them. The distinctive character of my design is found in serrated and highly-polished ribs extending the length of the vase-body, the surface of which is ground off or lusterless.

What I claim as my invention is—

The design for a glass-vase body, in which serrated and highly-polished ribs extend longitudinally along the ground or lusterless surface of the body, substantially in the manner described.

FREDERICK S. SHIRLEY.

Witnesses:

WENDELL H. COBB,  
GEORGE F. TUCKER.



[Defendant's Exhibit "C"—Letters Patent No. 693,460, to S. Takaba, Patented February 18, 1902.]

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "C." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "C." Received Aug. 19, 1913. F. D. Monckton, Clerk.



S. TAKABA.  
LAMP SHADE.

(Application filed June 24, 1901.)

(No Model.)

Fig. 1.

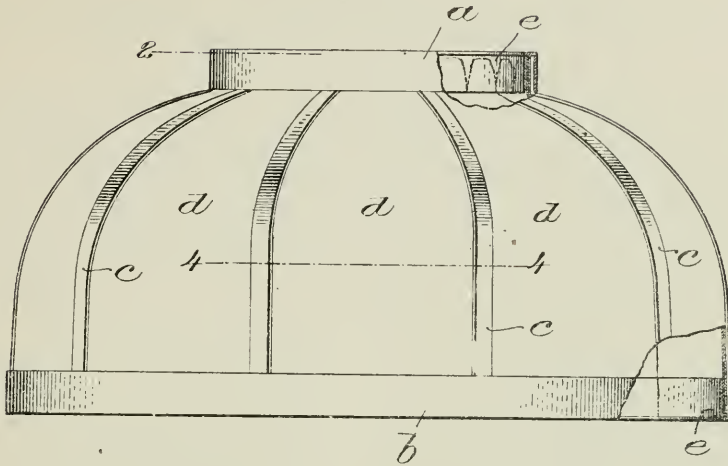


Fig. 3.

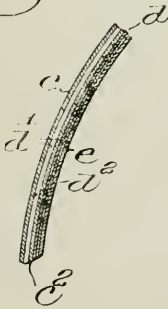


Fig. 4.

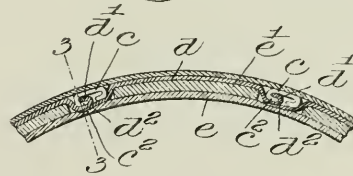
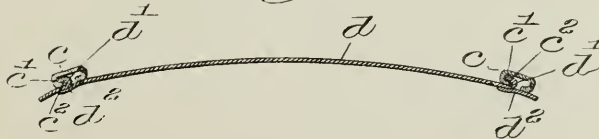


Fig. 5.



Witnesses:  
Fred S. Grunke  
Adolph H. Hain

Inventor,  
S. Takaba,  
by Henry S. Gregory  
attys





SHIRO TAKABA, OF BOSTON, MASSACHUSETTS.

## LAMP-SHADE.

SPECIFICATION forming part of Letters Patent No. 693,460, dated February 18, 1902.

Application filed June 24, 1901. Serial No. 65,785. (No model.)

*To all whom it may concern:*

Be it known that I, SHIRO TAKABA, a subject of the Emperor of Japan, residing at Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Lamp-Shades, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is an improvement in lamp-shades of the kind called "Japanese" lamp-shades, in which a light frame is provided with panels or sections of ornamental material, usually of a translucent nature, commonly paper, which is hand-painted or otherwise decorated. Shades of this character have commonly been composed heretofore of a light wooden frame, to which the paper panels have been pasted. Such frames, however, are easily injured and rapidly deteriorate under the influence of the extreme heat from the lamp, so that they become brittle and easily broken, and also it is difficult to paste the paper panels in place and retain them properly on account of the curvature and materials. Accordingly I have devised the hereinafter-described shade of an exceedingly light and durable character, consisting of a metal frame containing specially-formed ribs, which receive the vertical edges of the panel in interlocked relation in such a manner as to give the shade permanence and stability of shape, while at the same time facilitating its construction and producing a trim and neat appearance.

The constructional details of my invention will be pointed out more fully in the following description, reference being had to the accompanying drawings, in which I have shown a preferred embodiment of the invention, and the latter will be further defined in the appended claims.

In the drawings, Figure 1 represents in side elevation a shade containing my invention, parts thereof being broken out for clearness of illustration. Fig. 2 is an enlarged horizontal sectional view taken on the line 2, Fig. 1. Fig. 3 is a transverse vertical section taken on the line 3 3, Fig. 2. Fig. 4 is an enlarged horizontal section taken on the line 4 4, Fig. 1.

As herein shown, the frame consists of upper and lower rings *a b* and vertical ribs *c*,

properly bent or arched, the whole, when of metal, being soldered or otherwise secured together. These inclose a plurality of panels *d*, although it will be understood that I do not restrict myself in all respects to the details of shape and arrangement shown. The ribs *c* are preferably of metal capable of being rolled inwardly to provide a longitudinal pocket *c'* or overhanging retaining-flange *c''* for receiving and holding the inturned edge *d'* of the adjacent panel.

It is difficult to paste a paper panel to a metal rib, and, as already stated, it is difficult to retain the panel in proper shape and position simply by pasting it or laying it flat against a rib; but by tucking in the edge *d'* of the panel and preferably cementing it in place behind the retaining rib or flange *c''* of the rib, as shown, the panel is secured properly in place and the operation is performed with a despatch and neatness not practicable in the old construction referred to.

Having secured one edge of the panel, as shown in Fig. 4, the adjacent longitudinal edge *d''* of the next panel is preferably lapped over and cemented or otherwise secured to the edge *d'*, which has thus been inserted and cemented in place, as shown clearly in Figs. 2 and 4, paper supporting paper readily. In this manner the succeeding joints between the edges of the panels are made until the whole shade is completed, the resulting construction being exceedingly strong, neat in appearance, definite and certain in shape and position, and with no possibility of separation of the panels from the ribs or frame. At their ends the panels and ribs are clamped between bands *e* and the rings, said bands being preferably of some suitable pliable material, pasteboard answering for this purpose in some instances, retaining-pieces *e'* being preferably interposed, and the whole held in place by any suitable means, some kind of cement being usually sufficient.

The frame being of metal is exceedingly durable, maintaining its vigor and strength notwithstanding the heat to which it is subjected by the lamp, whereas the kind having wooden frames gradually became brittle.

The shade is not only strong, but rigid and very light.

It will be understood that while I prefer to

construct the shade precisely as shown, yet I do not limit myself thereto, as many changes may be resorted to within the spirit and scope of my invention, as will be more evident upon  
5 reference to the claims.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A lamp-shade, having its shade-surface  
10 composed of ribs and panels, a longitudinal pocket being provided in each rib, a longitudinal edge of an adjacent panel being bent into interlocked engagement with the pocket of the adjacent rib, and means applied to said  
15 longitudinal edge and distinct from said rib for maintaining said panel and rib permanently in their interlocked relation.

2. A lamp-shade, having its shade-surface composed of ribs and panels, said ribs having  
20 longitudinal pockets in their undersides, one longitudinal edge of a panel being bent back

on itself and interlocked with the adjacent rib, and a longitudinal edge of the contiguous panel being secured to the back of the panel thus interlocked.

3. A lamp-shade, having its shade-surface composed of ribs and panels, said ribs having longitudinal pockets in their undersides, one longitudinal edge of a panel being bent back on itself and interlocked with the adjacent  
30 rib, a longitudinal edge of the contiguous panel being secured to the back of the panel thus interlocked, and a ring and band, the upper ends of said panels and ribs being clamped between said ring and band.

In testimony whereof have signed my name to this specification in the presence of two subscribing witnesses.

SHIRO TAKABA.

Witnesses:

GEO. H. MAXWELL,  
WILHELMINA C. HEUSER.

[Defendant's Exhibit "D"—Letters Patent No. 10,235, to E. Cairns, Patented September 11, 1877.]

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "D." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "D." Received Aug. 19, 1913. F. D. Monckton, Clerk.



DESIGN.

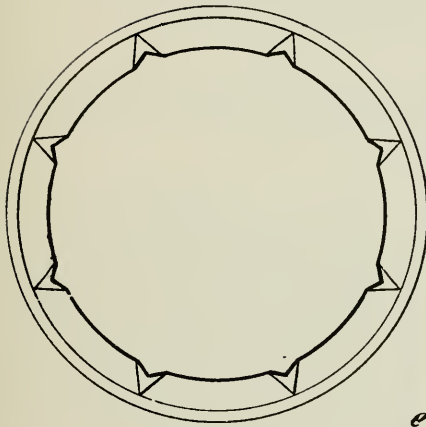
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**E. CAIRNS.**  
**SPEAKING-TRUMPETS.**

No. 10,235.

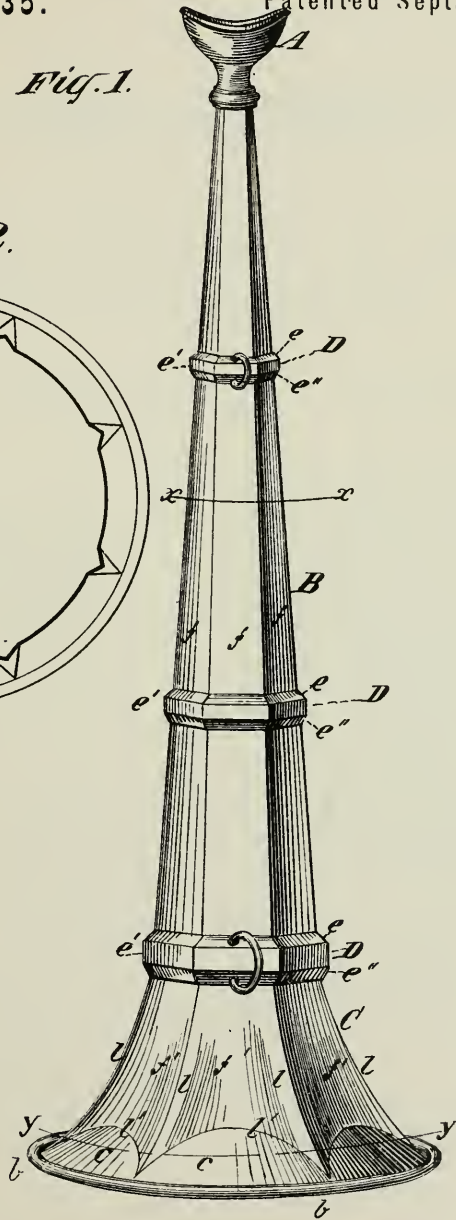
Patented Sept. 11, 1877.

*Fig. 1.*

*Fig. 2.*



*Fig. 3.*



*Witnesses*  
*John Beecher*  
*Edw. Haynes*

*Edward Cairns.*  
*by his Attorneys*  
*Brown & Allen*





# UNITED STATES PATENT OFFICE.

EDWARD CAIRNS, OF MORRISTOWN, NEW JERSEY.

## DESIGN FOR SPEAKING-TRUMPETS.

Specification forming part of Design No. **10,235**, dated September 11, 1877; application filed August 24, 1877.  
[Term of Patent 7 years.]

*To all whom it may concern:*

Be it known that I, EDWARD CAIRNS, of Morristown, in the county of Morris and the State of New Jersey, have originated and designed a Design for Speaking-Trumpets, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, making part of this specification.

Figure 1 in the drawing represents a perspective view of a speaking-trumpet embodying my design.

A represents the mouth-piece, B the tube, and C the bell, of the trumpet. The tube B has the form of a truncated polygonal pyramid, extending from the bell C to the mouth-piece A, and presents upon its outer surface the equal and geometrically-similar facets *f*, arranged in such manner that a cross-section made in any part of said tube at right angles with its central longitudinal axis will be a regular equilateral polygon, as shown in Fig. 2.

The bell C is, in form, partly pyramidal and partly conical. The flaring polygonal part comprises external curved facets *f'*. Said facets *f'* are extensions of the facets *f*, and their lines of junction *l* extend to and termi-

nate at the bead *b* at the outer margin of said bell. Said facets *f'* are, moreover, slightly concave on their outer surfaces, from which conformation their lines of intersection *l'* with the round flaring part *c c c* of the said bell are marked curves, giving the entire border of the flaring polygonal part where it joins the said round flaring part a scalloped form. A cross-section through the said conical and pyramidal parts of the bell gives the figure shown in Fig. 3. Upon the tube B are formed or attached at intervals polygonal bands D, having three sets of flat facets, *e e' e''*, so arranged that a cross-section of any of said bands made at right angles with any of said facets will give the figure of a trapezoid the not parallel sides of which are equal.

I claim—

The design for a speaking-trumpet consisting of the polygonally-formed tube B, the combined pyramidal and conical bell C, and the faceted bands D, as herein shown and described.

EDWD. CAIRNS.

Witnesses:

FRED. HAYNES,  
BENJAMIN W. HOFFMAN.





[Defendant's Exhibit "E"—Letters Patent No. 165,912, to W. H. Barnard, Patented July 27, 1875.]

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "E." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "E." Received Aug. 19, 1913. F. D. Monckton, Clerk.



FIG. I.

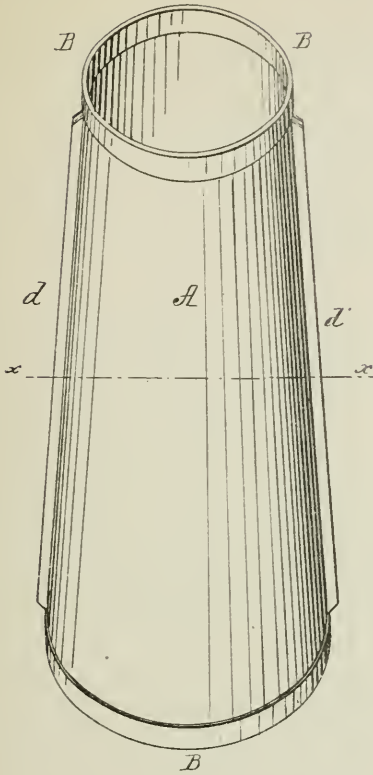


FIG. III.

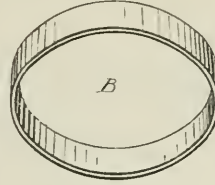


FIG. II.

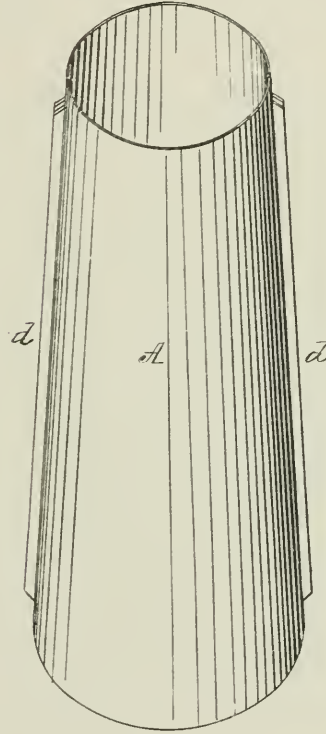


FIG. V.

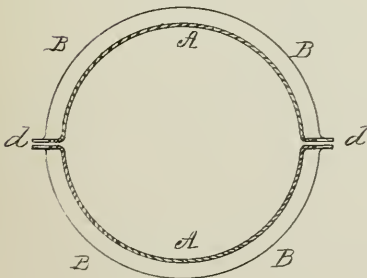
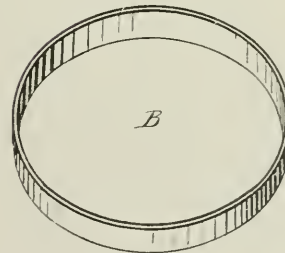


FIG. IV.



WITNESSES:

J. S. Goumby  
W. H. Norris

INVENTOR

William H. Barnard

By James L. Norris.

Atty



# UNITED STATES PATENT OFFICE.

WILLIAM H. BARNARD, OF SEDALIA, MISSOURI.

## IMPROVEMENT IN LAMP-CHIMNEYS.

Specification forming part of Letters Patent No. **165,912**, dated July 27, 1875; application filed January 4, 1875.

*To all whom it may concern:*

Be it known that I, WILLIAM H. BARNARD, of Sedalia, in the county of Pettis and State of Missouri, have invented certain new and useful Improvements in Lamp-Chimneys, of which the following is a specification:

My invention relates to certain improvements in that class of lamp-chimneys which are constructed of two longitudinal sections, united at their edges, and properly bound or clasped together, for the purpose of allowing for the expansion and contraction of the glass when subjected to sudden changes of temperature, and preventing the chimney from cracking or breaking.

The object of my invention is to secure a more perfect joint at the point of union of the two sections, and provide a more secure and reliable device for binding the two sections together, than has been heretofore accomplished in the chimneys of this class, as ordinarily constructed; and my invention consists in constructing a chimney of two longitudinal sections or parts, as usual, each section having a longitudinal flange on its edges, which unite and form a longitudinal projection or edge on the outside of the chimney when the sections are bound together.

By this construction a broad face is obtained along the edges of each section, which form, when properly ground and placed together, a perfect joint.

In the drawings, Figure 1 is a perspective view of my improved lamp-chimney; Fig. 2, a similar view of the same with the end ferrules removed. Figs. 3 and 4 are detached views of the top and bottom ferrules, respectively; and Fig. 5 is a section on line *xx* of Fig. 1.

The letters A A represent the sections composing the chimney. Along the edges of each section, on the outside, a longitudinal flange, *d*, is formed. The faces of these flanges

are accurately ground, so as to form a perfectly tight joint when the sections are joined together. The flanges do not extend quite to the end of the sections, but terminate a short distance from said ends, in order to allow the sections to set into the annular ferrules which bind them together. These annular ferrules are represented by the letters B B. They are constructed so as to grasp the edges of the sections at their ends, both on the inside and outside, and thus firmly bind them together.

It will be seen that by the above-described construction of the sections a broad face will be formed along the edges of the sections at the point of union, which will allow said edges to be readily and accurately ground, forming a perfect joint throughout the entire length of the sections, which it has hitherto been found impossible to obtain.

The annular ferrules, by grasping both the outside and inside of the chimney, will prevent any slipping of the sections, and thus necessarily bind them in place.

The chimneys thus constructed are admirably adapted for packing for transportation, as the sections will nest together, occupying but little room.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A lamp-chimney constructed of two sections, each of which is provided with laterally-projecting flanges, substantially as described, whereby, when the sections are placed together, a longitudinal projection is formed and a perfect joint secured, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

WILLIAM H. BARNARD. [L. S.]

Witnesses:

J. HALL BROWNE,  
J. S. JACKSON.



[Defendant's Exhibit "F"—Letters Patent No. 181,159, to C. W. Fallows, Patented August 15, 1876.]

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "F." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "F." Received Aug. 19, 1913. F. D. Monckton, Clerk.

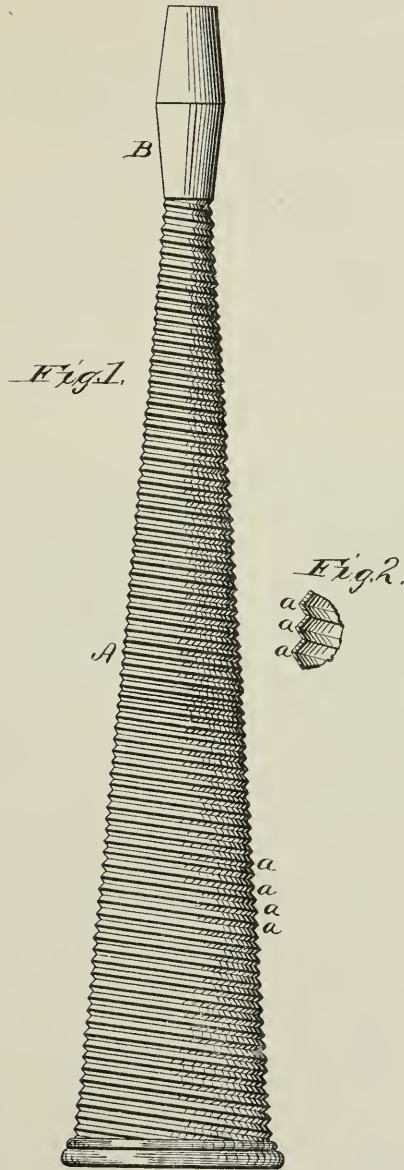




TOY BLOW HORN.

No. 181,159.

Patented Aug. 15, 1876.



WITNESSES

Frank L. Quinlan  
C. L. Cook

INVENTOR

Chas W. Fullows  
By Alexander Mason  
Attorneys



# UNITED STATES PATENT OFFICE.

CHARLES W. FALLOWS, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN TOY BLOW-HORNS.

Specification forming part of Letters Patent No. **181,159**, dated August 15, 1876; application filed June 27, 1876.

*To all whom it may concern:*

Be it known that I, CHARLES W. FALLOWS, of Philadelphia, in the county of Philadelphia, and in the State of Pennsylvania, have invented certain new and useful Improvements in Sheet-Metal Blow-Horns; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction of a blow-horn, as hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to manufacture and use the same, I will now proceed to more fully describe the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a side elevation of my blow-horn, and Fig. 2 represents a small section of the body.

The body A of the horn is made of corrugated sheet metal, in the usual tapering form, and is provided with a mouth-piece, B, having the usual reed. The metal which forms the body is cut in proper shape, and then passed between rollers or dies and crimped or corrugated. These corrugations are preferably

made on an incline, so that when the blank sheet is bent into tubular shape the corrugations *a a* will be on a short spiral, as shown in the drawings.

It is well known that the thinner the metal of which such horns are made the sharper the tone; but in cases where the horns are plain or smooth, and made of light metal, they do not have the requisite strength or keep proper shape, and in a short period would not be merchantable or present a neat appearance.

I claim for my invention that lighter and cheaper metal can be used, and that the same is more easily worked into proper shape by being light, that it costs less in construction, and that the sound made by the mouth-piece and reed is sharper than in the usual blow-horn made of plain or smooth metal.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A blow-horn made of corrugated sheet metal, for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 14th day of June, 1876.

CHARLES W. FALLOWS.

Witnesses:

JAMES FALLOWS,  
ANSON EATON.



[Defendant's Exhibit "G"—Letters Patent No. 409,196, to C. L. Hart, Patented August 20, 1889.]

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "G." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "G." Received Aug. 19, 1913. F. D. Monckton, Clerk.



C. L. HART.  
SHEET METAL PIPE.

No. 409,196.

Patented Aug. 20, 1889.



Fig. 1.

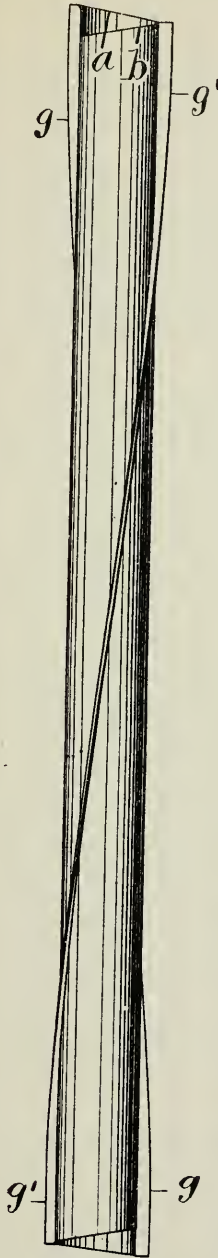
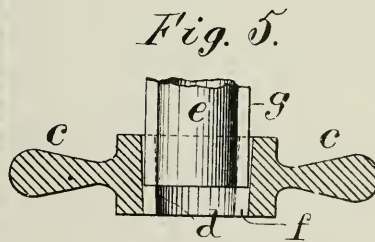
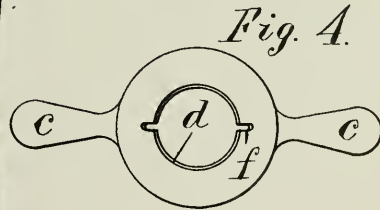
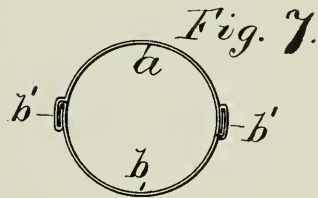
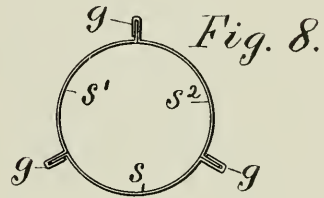
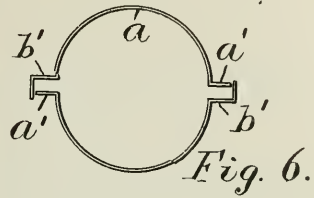


Fig. 2.



Fig. 3.



Attest:

L. Lee.  
F. C. Fischer.

Inventor.

Charles L. Hart, per  
Crane & Miller, Atty.



closed sufficiently to hold the sections together during the twisting operation, and the seams are, after the pipe is twisted, permanently closed to hold the sections in their twisted position.

It will be readily perceived by comparing Figs. 1 and 2 that the spiral seam in Fig. 2 is necessarily longer, upon the same pipe than the straight seam in Fig. 1, and it will therefore be obvious that in the twisting operation one or more of the flanges  $a'$  must slide longitudinally upon certain of the flanges  $b'$  an amount corresponding to the difference in the length of the straight and spiral seams, and that the end of each section will assume an angle with the axis of the pipe, owing to the twisting of each section-blank around such axis. All the seams are not therefore rigidly closed prior to the twisting operation, as such closing would cause a great resistance to such sliding movement of the flanges, but part only of the seams, as the seam  $g'$  in Fig. 2, are closed rigidly before the pipe is twisted to hold the sections firmly in their twisted position.

It will be noticed in Fig. 2 that the ends of the blanks  $a$  and  $b$  coincide upon the closed seam  $g'$ , thus forcing the sliding of the flanges to occur upon the seam  $g$ , at the ends of which the displacement is obvious. It will also be understood that the metal in the flanges  $a'$  and  $b'$  is materially changed in form during the twisting operation, and receives a permanent set to such form before and during the final closing of the seams. It is well known that longitudinal blanks bent in the form shown in Fig. 6 are in practice, when formed, more or less warped or buckled, so that the flanges  $a'$  and  $b'$  upon the opposite edges of the section  $a$  or  $b$  would not lie in the same flat plane. The seaming of the sections together brings the flanges  $a'$  and  $b'$  into contact without materially affecting the tendency of the sections to warp or buckle, and a perfectly straight pipe is not therefore produced by the mere joining of the seams. I have, however, discovered that the twisting operation serves to remove all the buckle from the pipe and to make it exceedingly straight, while the "set" imparted to the respective sections and the seams formed upon their edges serve to hold the pipe permanently in such straight condition. By retaining the seams in a radial position upon the finished pipe at the close of the final seaming operation, as shown in Figs. 2, 3, and 8, the standing seam greatly re-enforces the pipe in every direction and imparts to it an unusual degree of strength and rigidity.

It will be understood by reference to Fig. 1 that the edges of the sections  $a$  and  $b$  in the untwisted pipe are parallel with the axis of the cylinder or pipe which they form, the curvature of the metal being transverse at the edges to such axis, while an inspection of Fig. 3 will show that the twisting operation entirely changes the cylindrical curva-

ture of the metal, so that the line of the curvature is not parallel with the edges of the sections, but at an angle thereto equal to the arc through which the pipe is twisted.

The spiral seam formed upon the pipe in my invention is a much longer and more gradual spiral than could be formed by spirally winding a single blank and securing its overlapped edges, and my construction is readily distinguished from any pipe having a single spiral seam instead of two or more, as in my invention.

The blanks for the sections may be formed with oblique ends, so that when the pipe is twisted its ends will be at right angles to its axis. When the standing seam is used, the pipe-lengths may be readily fitted together by flattening down or removing a portion of the seam at each end and fitting the ends to enter one into the other, as is common with sheet-metal pipes, and shown upon the pipe in Fig. 3 at  $h$  and  $h'$ .

It is immaterial how the pipes are twisted after seaming or how the seams are finally locked to hold the sections in their twisted position, and no means for locking the seams is therefore shown herein.

Having thus set forth my invention, what I claim is—

1. As a new article of manufacture, a sheet-metal pipe formed in two or more longitudinal sections and having twisted seams at the joints of the sections, substantially as herein set forth.

2. As a new article of manufacture, sheet-metal pipes in uniform lengths formed in two or more longitudinal sections and having twisted seams at the joints of the sections, substantially as herein set forth.

3. As a new article of manufacture, a sheet-metal pipe formed in two or more longitudinal sections and having twisted standing seams at the joints of the sections, substantially as herein set forth.

4. As a new article of manufacture, a sheet-metal pipe formed in two or more longitudinal sections and having twisted standing seams at the joints of the sections, with the projection of the seam removed at the ends of the pipe and the ends longitudinally flared and tapered to join the same in series, substantially as herein set forth.

5. As a new article of manufacture, a sheet-metal pipe formed in two or more longitudinal sections united by longitudinal standing seams and having the sections and seams twisted and held in a twisted condition by the locking of the seams, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES L. HART.

Witnesses:

ANSON O. KITREDGE,  
HENRY COLWELL.

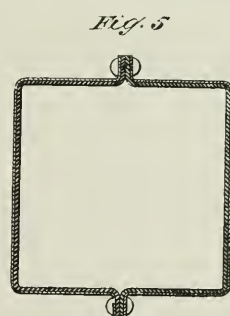
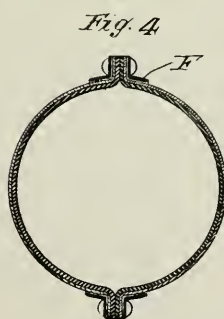
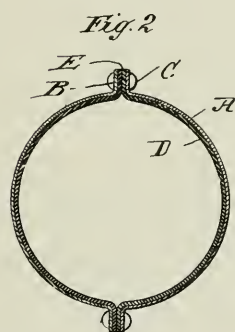
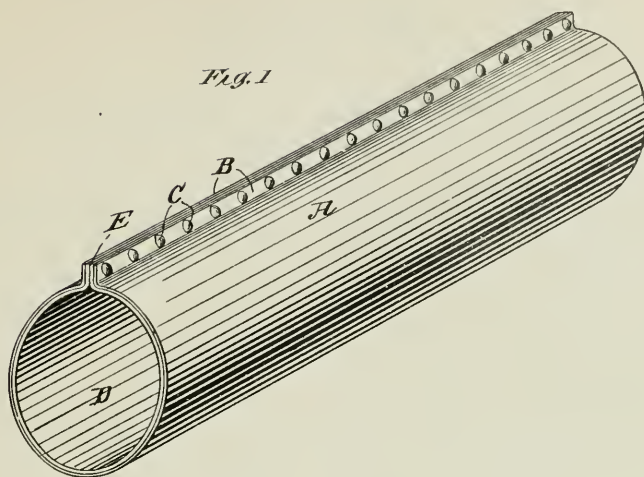


**[Defendant's Exhibit "H"—Letters Patent No. 406,332, to J. C. Bayles, Patented July 2, 1889.]**

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "H." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "H." Received Aug. 19, 1913. F. D. Monckton, Clerk.





Witnesses:

*Raphael Netter*  
*Robt. F. Gaylord*

*Jas. C. Bayles* *Inventor*  
*by*  
*Duncan Curtis & Page*  
*Attorneys.*



JAMES C. BAYLES, OF NEW YORK, N. Y.

## PIPE OR TUBE.

SPECIFICATION forming part of Letters Patent No. 406,332, dated July 2, 1839.

Application filed April 6, 1889. Serial No. 306,167. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES C. BAYLES, of the city, county, and State of New York, have invented certain new and useful Improvements in Pipes or Tubes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The present invention relates to the construction of pipes or tubes, and especially to that class of pipes that are adapted to conducting acidulous or other iron-destroying liquids: Thus in mining and similar operations it is found that much of the water that it is necessary to drain or draw off is more or less impregnated with sulphur or other elements that render it corrosive in its action upon metal pipes which usually are made of iron.

Heretofore it has been customary to a limited extent to use pipes made of wood or similarly non-corrosive material; but this kind of pipe is obviously impracticable in various respects. It is difficult to make, as well as expensive, especially in large sizes and in regions where there is little timber. It is cumbersome to handle and does not well serve where a water-tight pipe is needed.

It is therefore the object of the invention to produce a metal pipe which shall be capable of resisting the action of the iron-destroying fluids; and the invention consists of a pipe made up from sheet-iron and provided with a lining or sheathing of lead.

Referring to the drawings, Figure 1 shows a section of pipe embodying the invention and having but one seam. Figs. 2 to 5 are cross-sections of modified forms.

Referring to these views in detail, A represents the exterior or body part of the pipe. This body is composed of sheet-metal blanks, which is brought into cylindrical form by any suitable means, with outwardly-projecting flanges B along its longitudinal edges. These flanges are brought opposite each other and then secured together by the rivets C, or any other suitable form of connection—that is to say, bolts or screws may be used, or even any form of suitable clamp—and in the case of very thin metal the flanges may be made to clasp each other or lock together.

D is a lining of lead, which extends over

the entire inner surface of the metal body A. This lead lining will usually be of a thin gage, and before the seam parts of the iron body of the pipe are closed finally together the sheet of lead will be inserted in such body and worked down to conform to substantially the same form—that is, so as to lie closely on the inner surface of the sheet-iron. Of course the sheet-lead may be shaped with the body of the pipe when this is practicable, and still other ways of placing the lining within the body of the pipe and conforming it thereto will occur to those familiar with the art of pipe-making. This lead sheathing is to be flanged similarly to the blank of the body part, and the flanges E thus formed are to be brought together face to face and secured to and between the flanges B of the iron body. Thus the seam of the pipe as a whole consists of four thicknesses and forms a rib or wing extending outwardly from the surface of the pipe, which serves to stiffen and strengthen the pipe and exposes the junctional parts of the seam for easy manipulation in case of repair of leaks or ruptures.

It is essential in the construction of this pipe that the interior sheathing be secured between the flanges of the iron body. Not only is a tight seam readily formed, but the lining is held against collapsing or being forced away from the surface of the iron. Thus, as is well understood, the lead lining under the action of heat will expand and stretch, but it will not when subsequently cooled contract and return to its previous form, and the effects of long-continued expansion and contraction of the iron body of the pipe will tend to corrugate the lining and to force it away from contact with the inner face of the pipe, as well as to rupture it or cause it to collapse; but when the lining is attached to the body of the pipe the distortion of the lead lining is practically obviated, for the lining will be held against moving away from the iron. Where pipe of but a single seam is used, the pipe should be laid with the seam uppermost, so that the lining will be positively held up by the iron body, and not alone by virtue of the strength of its own arch, for then the action of contraction and expansion, which would be most exerted in the arch, will have no serious or detrimental effect.

Fig. 2 shows a form of pipe having two seams, but in other respects it is the same as the pipe of Fig. 1. Fig. 3 is another similar form of pipe composed of three sections and having three seams.

It is expected that the most available form of pipe would be one having two or more seams, as the sections of such a pipe may be most conveniently bunched and shipped from the factory to the place of use, where the sections may be secured together in pipe form. So, too, with such pipe, the separate sections are so nearly flat that it is a simple matter to apply the lead linings to them, which may very readily be done at the time of assembling them into pipe form. The lead in thin sheets would have but to be laid in the sections and could be quickly shaped thereto by mallets or other simple hand-tools, and in case the run of water does not fill the pipe, or does so rarely, then only the lower or underneath section or sections need be lined.

In Fig. 4 I show the seams provided with re-enforce pieces F, which are angle-bars lying in the angles of the seams, and are employed where a strong pipe is needed and the rigidity and strength of the seam parts is a matter of importance. These re-enforce bars may be of any other suitable form, or they may be of a single piece instead of separate strips located upon opposite sides of the seam and adapted to inclose the seam parts.

Fig. 5 shows one form of flat-sided pipe, this particular form being square and having a seam along the middle line of its two opposite sides.

The invention may be embodied in yet other forms of pipe; but it is believed those shown serve to illustrate the principle of the invention and its application.

Although I have described this pipe as applied to the drainage of mines and similar works, it will be obvious that its utility is not limited thereto, and that it is applicable to the conduction of any kind of liquids and under any circumstances where such pipe would be effective.

What I claim as new is—

1. A pipe composed of a sheet-iron section shaped into cylindrical form with outwardly-projecting flanges along its opposite longitudinal edges, and a sheet-lead section similarly shaped and arranged within the sheet-iron section, with its flanges brought together face to face and secured to and between the flanges of the iron section.

2. A pipe composed of two or more sheet-iron sections, each shaped into the partial form of the pipe, with outwardly-projecting flanges at their longitudinal edges and provided with a sheet-lead lining; the sections being arranged in pipe form and their flanges secured together.

3. A pipe composed of sections of sheet-iron shaped longitudinally into pipe form and secured together along their longitudinal edges, and having a sheet-lead lining which is secured to the iron sections at their seams.

JAMES C. BAYLES.

Witnesses:

FRANK E. HARTLEY,  
ERNEST HOPKINSON.



[Defendant's Exhibit "I"—Letters Patent No. 34,907, to C. McVeety and J. F. Ford, Patented August 6, 1901.]

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "I." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "I." Received Aug. 19, 1913. F. D. Monekton, Clerk.





C. McVEETY & J. F. FORD.

SHIP'S VENTILATOR.

(Application filed July 10, 1901.)

FIG. 1.

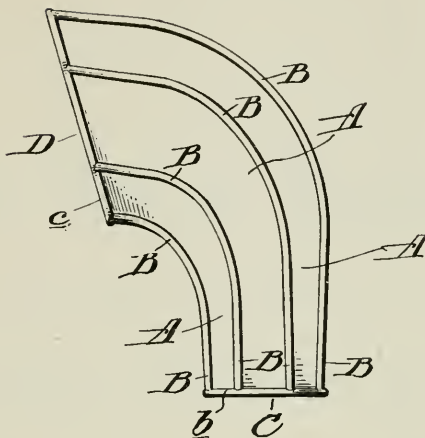


FIG. 2.

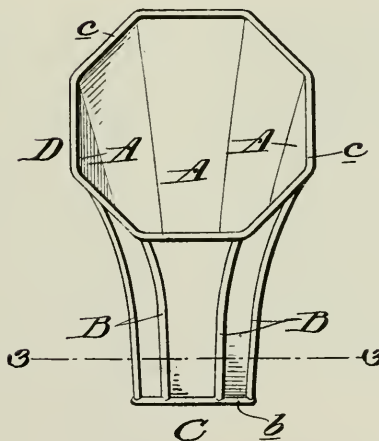
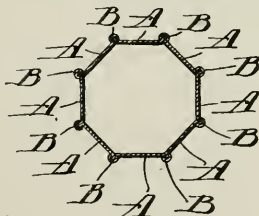


FIG. 3.



WITNESSES:

Coroman S. Sterling  
Richard H. Sharp

INVENTORS:

Charles McVeety  
John F. Ford  
By their attorney  
Walter W. Calmore



# UNITED STATES PATENT OFFICE.

CHARLES McVEETY AND JOHN F. FORD, OF PHILADELPHIA, PENNSYLVANIA.

## DESIGN FOR A SHIP'S VENTILATOR.

SPECIFICATION forming part of Design No. 34,907, dated August 6, 1901.

Application filed July 10, 1901. Serial No. 67,794. Term of patent 14 years.

### *To all whom it may concern:*

Be it known that we, CHARLES McVEETY and JOHN F. FORD, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented and produced a new and original Design for Ships' Ventilators, of which the following is a specification.

Referring to the accompanying drawings, forming part of this specification, Figure 1 illustrates a side elevation of a ventilator, showing our new design. Fig. 2 represents a front elevation of the same, and Fig. 3 shows a horizontal section taken on line 3 3 of Fig. 2.

As shown in the drawings, the leading or material feature of our design consist of a series of plates A flat in cross-section, as shown in Fig. 3. The plates have arranged at the point of junction ribs B, and at the base C and mouth D are arranged ribs b and c, which intersect the ribs B.

The general contour of the ventilator is that of a curved tapering figure in the form of a cornucopia, being octagonal in cross-section and having convex ribs at the base and mouth, and similar ribs at the intersection of the plates, forming the walls of the ventilator.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The design for a ventilator substantially as herein shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES McVEETY.  
JOHN F. FORD.

Witnesses:

D. P. S. GARWOOD,  
H. E. COUGHLIN.



[Defendant's Exhibit "J"—Letters Patent No. 612,639, to J. Clayton, Patented October 18, 1898.]

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "J." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "J." Received Aug. 19, 1913. F. D. Monekton, Clerk.



J. CLAYTON.  
AUDIPHONE.

(Application filed Dec. 8, 1896.)

(No Model.)

Fig. 1.

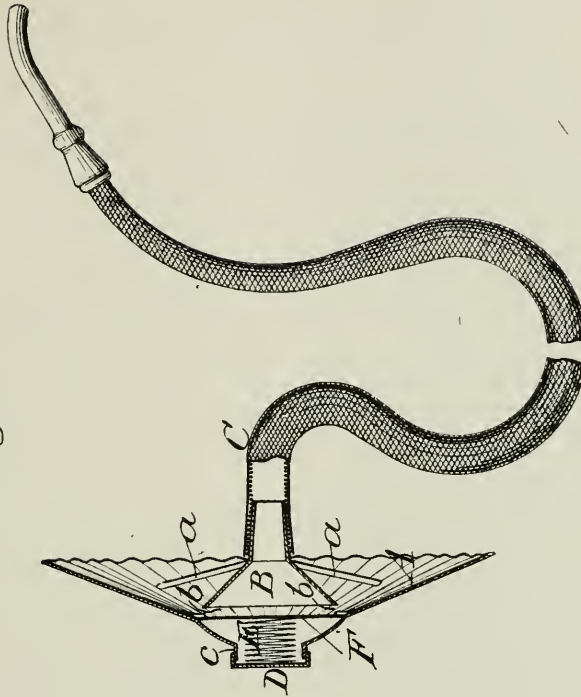
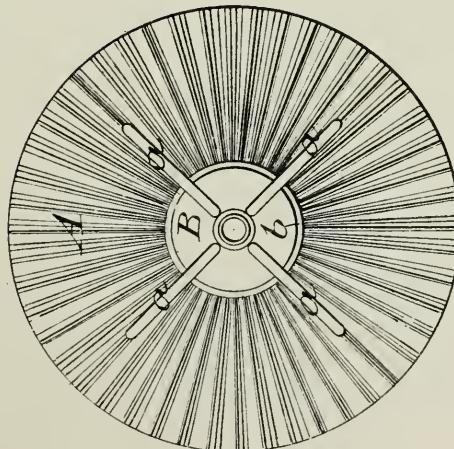


Fig. 2.



Witnesses:-  
George Barry Jr.  
Edward (Vice)

Inventor:-  
James Clayton  
by attorneys  
Brown & Howard





# UNITED STATES PATENT OFFICE.

JAMES CLAYTON, OF NEW YORK, N. Y.

## AUDIPHONE.

SPECIFICATION forming part of Letters Patent No. 612,639, dated October 18, 1898.

Application filed December 8, 1896. Serial No. 614,868. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES CLAYTON, of the city of New York, (Brooklyn,) in the county of Kings and State of New York, have invented a new and useful Improvement in Audiphones, of which the following is a specification.

I will first describe my invention with reference to the accompanying drawings and afterward point out its novelty in the claims.

Figure 1 in the accompanying drawings represents a central sectional view of one example of an audiphone embodying my invention and provided with a flexible ear-tube. Fig. 2 is a face view of the same with the flexible ear-tube omitted.

A is a conical disk, opposite to the concave face of which is concentrically arranged the trumpet-mouth B of a sound-conducting tube C, represented as a flexible ear-tube, the said trumpet-mouth having its concavity in the opposite direction to that of the disk and being so affixed to the disk, as by radial arms *a a*, that an annular opening *b* is left between the edges of said mouth and the face of the disk. In front of the central portion of the disk opposite the trumpet-mouth there is distended a diaphragm F of suitable material, as very thin steel, the edges of the said diaphragm being united with the disk A, so that the annular opening *b*, before mentioned, is also between the diaphragm and the trumpet-mouth.

The portion of the disk A which surrounds the trumpet-mouth B is, in the example of the invention represented by the drawings, corrugated in radial lines from the diaphragm to its own circumference. The said disk has a central opening, around which is a socket *c*, and to this socket is fitted a cap D. Between this cap and the back of the diaphragm is placed a light coil-spring E, which is made to press with more or less force on the diaphragm, according as the cap is adjusted on the socket toward or from the diaphragm.

The operation is as follows: The instrument is held by the listener with the concave face of the disk A toward the speaker or

source of sound, and the end of the ear-tube is placed in his ear. The sound-waves striking the disk are gathered therein toward the center thereof and are thereby directed over the diaphragm and into the trumpet-mouth of the conducting or ear tube, the vibrations of the diaphragm greatly assisting in the sound transmission. The adjustment of the cap D and the adjustment of the pressure of the spring upon the diaphragm thereby produced give the diaphragm greater or less tension and a more or less active vibration, which can be regulated as may be found desirable by the person using the instrument. It has been found by careful and repeated experiments in the use of an instrument of this kind that as compared with a smooth conical disk the radially-corrugated disk is very much more effective.

What I claim as my invention is—

1. In an audiphone, the combination of a conical disk, a flexible diaphragm distended in front of the central portion of the concave face of and having its edges attached to said disk, and an ear-tube having a trumpet-mouth which is attached concentrically to said disk with its concavity in the opposite direction to the concavity of the disk and with an annular opening between its edges and the disk and diaphragm, substantially as herein described.

2. In an audiphone, the combination of a conical disk having a central opening, a flexible diaphragm distended in front of the concave face of and having its edges attached to said disk, an adjustable cap fitted to the central opening of the said disk behind the diaphragm, a spring located between the said cap and diaphragm for varying the tension of the diaphragm as the cap is adjusted, and an ear-tube having a trumpet-mouth attached to the said disk at the concave face thereof opposite to and spaced from the diaphragm, substantially as herein described.

JAMES CLAYTON.

Witnesses:

FREDK. HAYNES,  
LIDA M. EGBERT.



**[Defendant's Exhibit "K"—Letters Patent No. 651,368, to J. Lanz, Patented June 12, 1900.]**

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "K." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "K." Received Aug. 19, 1913. F. D. Monckton, Clerk.



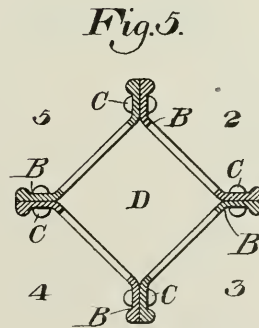
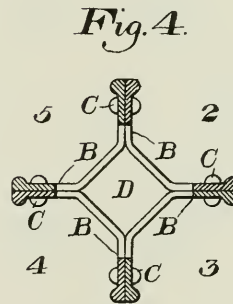
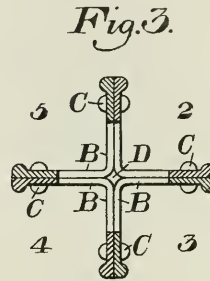
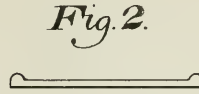
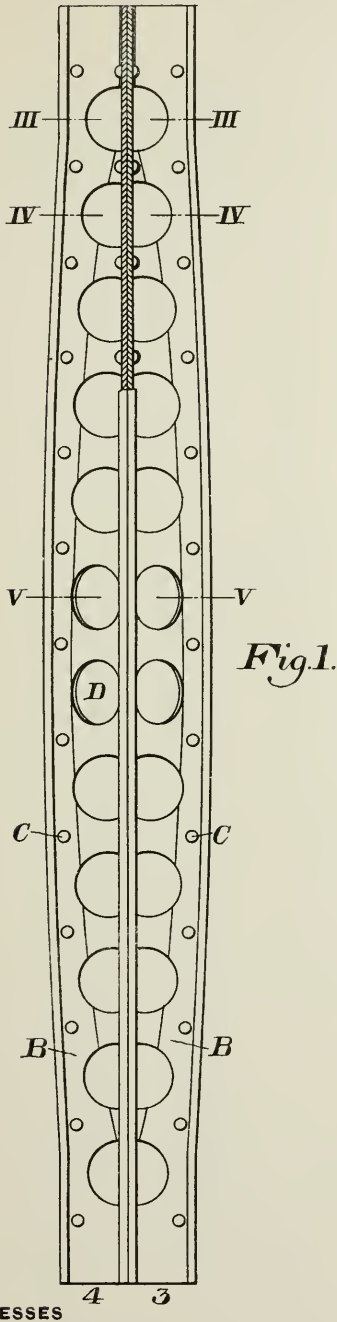
J. LANZ.

COMPOSITE METAL BEAM OR COLUMN.

(Application filed Jan. 12, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
 Warren W. Swartz  
 J. M. Corwin

INVENTOR  
 John Lanz  
 by Baxendell & Baxendell  
 his Attorneys.



J. LANZ.

COMPOSITE METAL BEAM OR COLUMN.

(Application filed Jan. 12, 1900.)

(No Model.)

2 Sheets—Sheet 2.

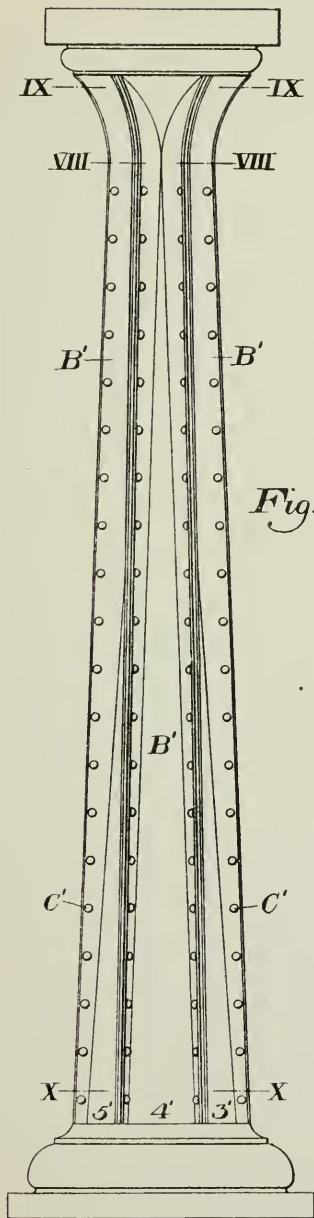


Fig. 6.

Fig. 7.



Fig. 8.

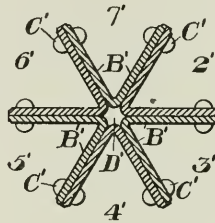


Fig. 9.

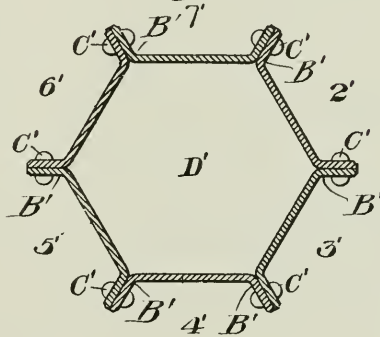
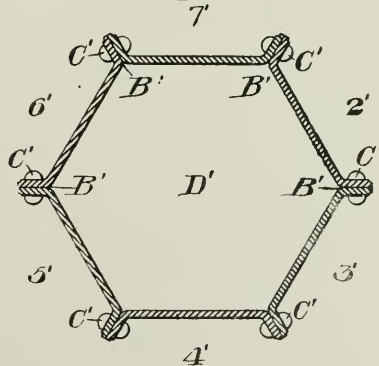


Fig. 10.



WITNESSES

Warren W. Swartz  
H. M. Corwin

INVENTOR

John Lanz  
by Baxendell & Baxendell  
his Attorneys.





## COMPOSITE METAL BEAM OR COLUMN.

SPECIFICATION forming part of Letters Patent No. 651,368, dated June 12, 1900.

Application filed January 12, 1900. Serial No. 1,204. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN LANZ, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Composite Metal Beams or Columns, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 shows in side elevation a composite metal bridge-beam constructed in accordance with my invention. Fig. 2 is an end view of the original form of one of the metal pieces of which the column is composed. Figs. 3, 4, and 5 are cross-sections, on a larger scale, on the lines III III, IV IV, and V V of Fig. 1, respectively. The figures on Sheet 2 show a modified construction. Fig. 6 is a side elevation of a composite column embodying my invention. Fig. 7 is an end view of one of the pieces of the column in its original shape. Figs. 8, 9, and 10 are horizontal cross-sections on the lines VIII VIII, IX IX, and X X, respectively, of Fig. 6, but on a larger scale.

The object of my invention is to provide a composite metal beam, brace, or column for use in bridge construction, buildings, &c., which shall be tapering or of varying diameter at different points of its length.

Referring to Sheet 1 of the drawings, in making my improved beam or column I take a number of metal plates or beams 2, 3, 4, and 5, which may consist either of flanged structural shapes or of unflanged metal plates, and the same being in angle form they are set with their angles in proximity and their flanges B B abutted against each other, preferably in line with radii of the beam or column and riveted together, as at C C, so as to constitute the composite beam shown in Fig. 1. In order to taper such column or beam, its elements 2 3 4 5 are shaped by pressing or otherwise so that the portions of the flanges B B which come in contact and through which the rivets pass vary in width conformably to the taper desired. The consequence is that the interior space D of the column or beam also varies in size, and the greater this space the greater will be the diameter of the composite column or beam. I am therefore enabled from metal pieces or plates of uniform size to make beams or columns having any desired taper or diameter

or variation of dimensions at different points. They may be made tapering from the bottom up, as in Fig. 6, or with a swell at the middle, as in Fig. 1. Indeed it will readily be seen that my improvement affords the greatest facility for shaping the column according to the particular use for which it is intended and for making it highly ornamental in appearance when desired.

In the figures on Sheet 2 of the drawings I show a column made of six metal plates 2' 3' 4' 5' 6' 7', which, as shown in Fig. 7, are originally unflanged, but which are pressed into angular form and are assembled with their flanges B' B' in contact and connected by rivets C' C', as above explained with reference to the figures on Sheet 1. By varying the width of the flanges B' the column is made of tapering form.

Within the scope of my invention as defined in the claims many changes may be made by the skilled mechanic, since

What I claim is—

1. A composite column, brace, or beam, made up of metal pieces of uniform width and angular form, having meeting flanges which are fastened together, said meeting flanges being varied in width at different points to vary the diameter of the column; substantially as described.

2. A composite metal beam or column made up of four pieces, 2, 3, 4, 5, of uniform width and angular form set with their angles in proximity to each other and with their flange portions fastened together, said flange portions being varied in width to impart to the beam or column varying diameters at different points; substantially as described.

3. A composite column, brace or beam made up of metal pieces of uniform width formed with suitable angles, having riveted flanges lying in a radius from the center of the column, said parallel flanges being varied in width to conform to the taper or diameter of the column desired at any point of its length; substantially as described.

In testimony whereof I have hereunto set my hand.

JOHN LANZ.

Witnesses:

H. M. CORWIN,  
GEO. B. BLEMING.



[Defendant's Exhibit "L"—Letters Patent No. 705,126, to G. Osten and W. P. Spalding, Patented July 22, 1902.]

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "L." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "L." Received Aug. 19, 1913. F. D. Monckton, Clerk.



# HORN FOR SOUND RECORDING AND REPRODUCING APPARATUS

(Application filed June 27, 1901.)

(No Model.)

Fig. 6.

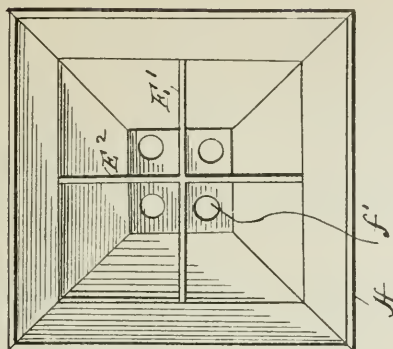


Fig. 4.

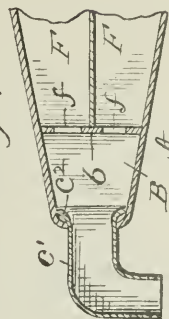


Fig. 5.

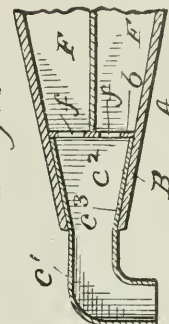


Fig. 3.

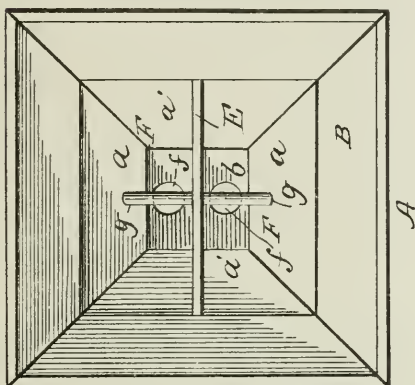


Fig. 1.

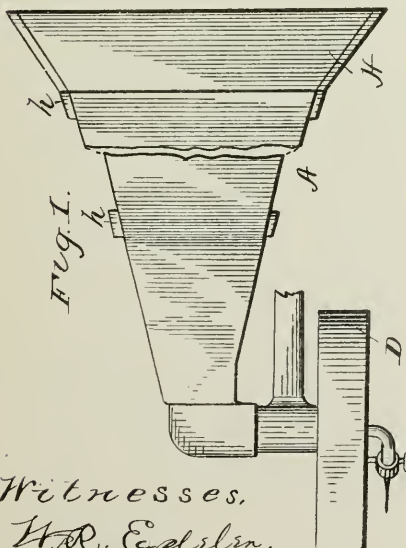
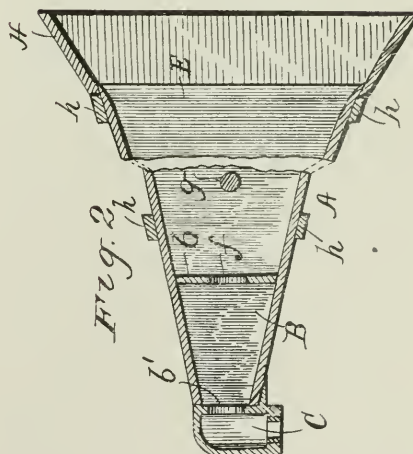


Fig. 2.



Witnesses,

H. R. Edison,  
J. E. Davis

Inventors

George Osten and  
William P. Spalding  
by Philip Mauro atty.





GEORGE OSTEN AND WILLIAM P. SPALDING, OF DENVER, COLORADO.

## HORN FOR SOUND RECORDING AND REPRODUCING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 705,126, dated July 22, 1902.

Application filed June 27, 1901. Serial No. 66,301. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE OSTEN and WILLIAM P. SPALDING, residents of Denver, Colorado, have invented a new and useful Improvement in Horns for Sound Recording and Reproducing Apparatus, which invention is fully set forth in the following specification.

Our Patent No. 685,409, dated October 29, 1901, claims a multiple horn consisting of a plurality of small horns all communicating at their smaller ends with one and the same recorder or reproducer and a hood or bell common to all of the small horns and into which said small horns discharge or from which they receive the sounds at their larger ends.

Although the apparatus of our present invention, in its preferred form, includes the features of construction above referred to, as well as the transmitter described in said patent, the present invention is designed more particularly as an improvement upon the patented invention.

We have discovered that a large horn, of any suitable material, partitioned into a plurality of small horns by a partition or partitions, preferably of wood, acting as a sounding-board, gives improved results, and that still better results are obtained by the use of sound-posts in conjunction with the sounding-board partition or partitions. The manner in which we utilize these discoveries will be best understood by reference to the accompanying drawings, illustrating several embodiments of our invention, and wherein—

Figure 1 is a plan view showing a recorder or reproducer connected with the horn. Fig. 2 is a longitudinal sectional view of the horn. Fig. 3 is a view looking into the large end of the horn. Figs. 4 and 5 are views illustrating modifications of the elbow leading to the recorder or reproducer. Fig. 6 is a view looking into the larger end of a modified construction of horn.

A is the body of the horn, which, as shown, is made of four tapering thin wooden sides  $a a a' a'$ , secured together along their edges, thus forming a body part of rectangular cross-section. The body part may, however, be made of circular, oval, or any other suitable shape in cross-section.

B is a distributing chamber or mouth at

the small end of the horn, bounded at one end by a transverse partition or wall  $b$ . At its smaller end mouth B communicates, through an opening  $b'$ , with a throat C, leading through a wooden elbow or short tube  $c$ , which is secured to the small end of the horn. Elbow or short tube  $c$  may be bent, as shown, or straight. At its outer end throat C communicates with a reproducer or recorder D, Fig. 1.

E is a sounding-board extending forward from partition  $b$ , secured at its side edges to the opposite sides  $a' a'$  of body A and longitudinally dividing the interior of the latter into two small horns F F, which communicate with the distributing chamber or mouth B through openings  $ff$  in partition  $b$  on opposite sides of the sounding-board E.

$g g$  are two sound-posts interposed between the sounding-board E and the sides  $a a$ . They communicate vibrations from the sounding-board to the sides of the horn, and vice versa.

$h h$  are outside strips or ribs extending across sides  $a' a'$  in a direction practically parallel to the sound-posts and acting to strengthen the tone and vibrations, as well as making the horn more durable. The sound-posts and ribs are of special importance, as they act in practically the same manner as do the sound-post and ribs of a violin. They improve the tone quality by softening and mellowing the same, at the same time increasing the carrying properties and distinctness of the sounds, particularly where the horn is made completely of wood. The metallic sound so common to sound recording and reproducing apparatus is effectually eliminated.

Any double effect that may otherwise be produced by the sounds coming from the two small horns F F is avoided by the action of the single bell or hood H, into which both of said small horns discharge, said hood causing the sounds coming from the separate small horns to blend together before they are finally discharged from the horn. As shown in the drawings, hood H is also made of wood and secured to the end edges of sides  $a a a' a'$ .

As shown in Fig. 4, the elbow  $c'$  instead of being made of wood, as in Figs. 1 and 2, is made of brass or other suitable metal and has a flared or bell-shaped end  $c''$  opening into the distributing-chamber B. Fig. 5 illustrates a somewhat-similar arrangement, the flared or

bell-shaped end  $c^3$  of the elbow in this casing being of such length as to constitute a lining for the chamber B.

15 In the form of horn shown in Fig. 6 two sounding-boards  $E^1$   $E^2$ , disposed at right angles to each other longitudinally, divide the interior of the horn into four small horns, each communicating with the distributing-chamber, such as shown in Fig. 2, through an opening  $f^1$ . As the sounding-boards bear against all of the sides of the horn, no sound-posts are necessary in this arrangement.

What we claim is—

15 1. In sound recording and reproducing instruments, the combination of a multiple horn comprising a plurality of small horns separated from each other by a sounding-board, with a sound recorder or reproducer in communication with said multiple horn.

20 2. A multiple horn comprising a plurality of small horns separated from each other by a sounding-board and a common distributing chamber or mouth with which the small horns communicate at their smaller ends.

25 3. A multiple horn comprising a wooden body part divided interiorly into a plurality of small horns by a wooden sounding-board.

30 4. A horn comprising a plurality of small horns separated from each other by a sounding-board, a common distributing chamber or mouth with which the small horns communicate at their small ends, and a hood or bell common to all of the small horns and into which said small horns discharge or from which they receive the sounds at their larger ends.

35 5. A horn comprising a body part adapted to communicate at its small end with a recorder or reproducer, a lateral partition in the body part forming a mouth or distributing-chamber at the smaller end of the horn,

and a longitudinally-extending sounding-board dividing the interior of the body part outside of the mouth into two small horns communicating with the mouth through openings in the lateral partition. 45

6. A horn comprising a body part adapted to communicate at its small end with a recorder or reproducer, a lateral partition in the body part forming a mouth or distributing-chamber at the smaller end of the horn, a longitudinally-extending sounding-board dividing the interior of the body part outside of the mouth into two small horns communicating with the mouth through openings in the lateral partition, and a hood or bell common to all of the small horns and into which said horns discharge or from which they receive the sound at their larger ends. 55

7. A horn for use with apparatus for recording and reproducing sounds having a sounding-board longitudinally disposed therein. 60

8. A horn for use with apparatus for recording and reproducing sounds having a sounding-board longitudinally disposed therein and a sound-post interposed between the sounding-board and side wall of the horn. 65

9. A wooden horn for use with apparatus for recording and reproducing sounds having a wooden sounding-board longitudinally disposed therein and a sound-post interposed between the sounding-board and side wall of the horn. 70

In testimony whereof we have signed this specification in the presence of two subscribing witnesses. 75

GEORGE OSTEN.

WILLIAM P. SPALDING.

Witnesses:

W. A. RICE,

L. GOLDMAN.



**[Defendant's Exhibit "M"—Letters Patent No. 648,994, to M. D. Porter, Patented May 8, 1900.]**

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "M." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "M." Received Aug. 19, 1913. F. D. Monckton, Clerk.



M. D. PORTER.  
COLLAPSIBLE ACOUSTIC HORN

(Application filed July 31, 1899.)

2 Sheets—Sheet 1.

(No Model.)

Fig. 1

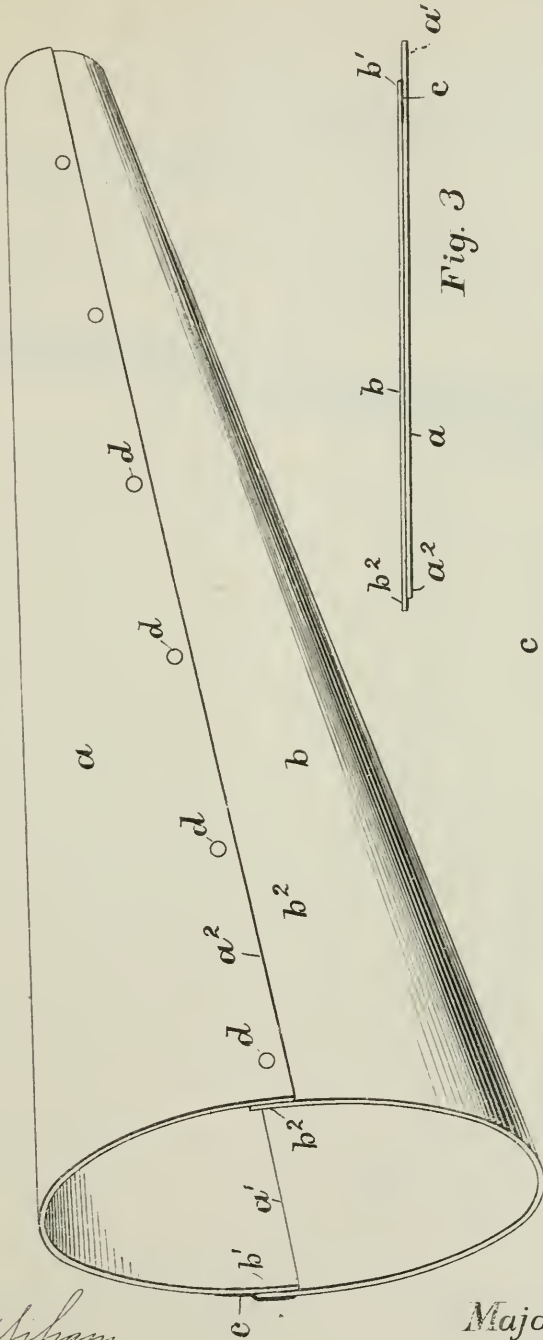


Fig. 3

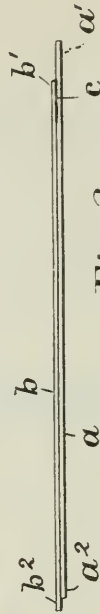
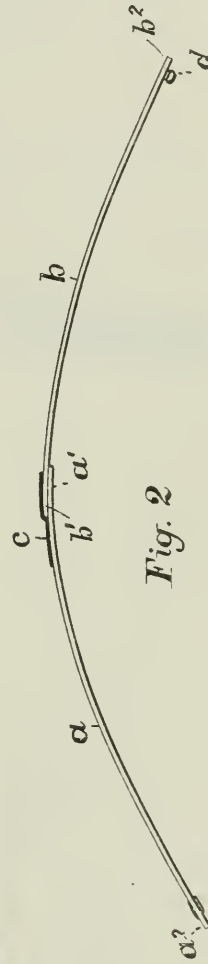


Fig. 2



Attest;

M. U. Latham  
F. O. Haller

Inventor,

Major D. Porter;

By A. B. Latham,  
His Attorney



M. D. PORTER.  
COLLAPSIBLE ACOUSTIC HORN

(Application filed July 31, 1899.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 4

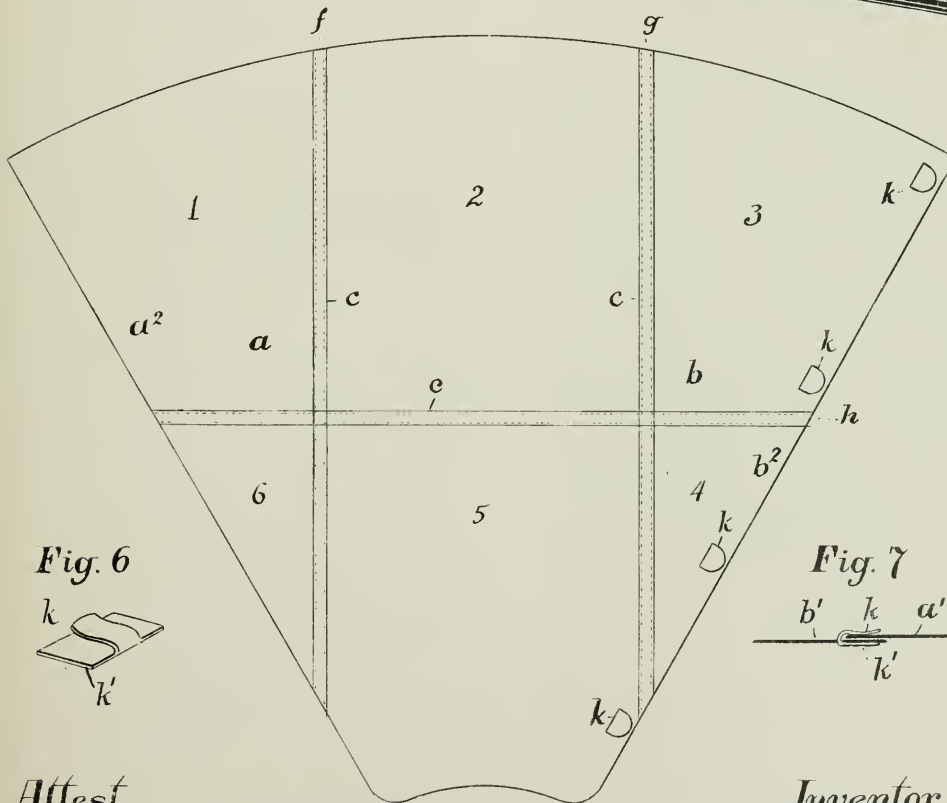
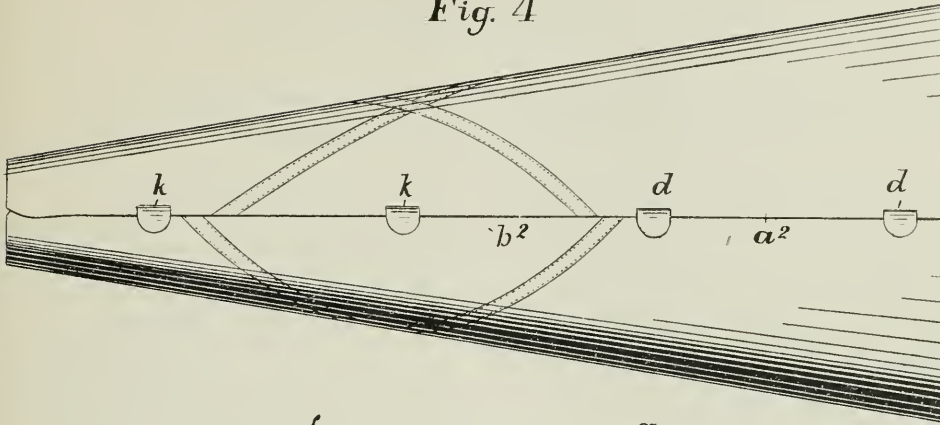
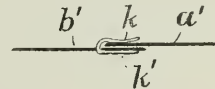


Fig. 6



Fig. 7



Attest

M. E. Upham  
F. E. Geller

Fig. 5

Inventor,

Major D. Porter;

By A. B. Upham,  
His Attorney



MAJOR D. PORTER, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE  
INTERNATIONAL STYLOPHONE COMPANY, OF SAME PLACE.

## COLLAPSIBLE ACOUSTIC HORN.

SPECIFICATION forming part of Letters Patent No. 648,994, dated May 8, 1900.

Application filed July 31, 1899. Serial No. 725,634. (No model.)

*To all whom it may concern:*

Be it known that I, MAJOR D. PORTER, a subject of the Queen of Great Britain, residing at New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Collapsible Acoustic Horn, of which the following is a full, clear, and exact description.

The object of this invention is the construction of a horn for general acoustic purposes, such as what is usually termed a "megaphone," or for phonographs and other talking-machines, which horn shall be capable of being folded into the smallest possible compass for greater convenience in transportation and storage, and yet can be immediately expanded into its perfect and normal condition for use. In accomplishing these results I form the horn from moderately-thin press-board, celluloid, or other material capable of ready, but not too easy, bending, and divide it longitudinally into two or more sections, with certain edges hinged together and the others provided with fastening devices easily engaged or disengaged. An ordinary hinged connection will not do for this purpose, however, as I have found from experiment, for the material being pliable only to a limited degree the hinges will become the apex of a somewhat-acute angle instead of an evenly-rounded curve. To remedy this defect in a simple and inexpensive manner, I form the hinge of some fabric or other pliable material and locate the same at some little distance back from the edge of one of the sections. By this means the outjutting edge serves as a fulcrum, which compels the material itself to bend instead of the hinge, and thereby gives to the horn the circular line in cross-section which is required.

Referring to the drawings forming part of this specification, Figure 1 is a perspective view of the horn embodying my invention. Fig. 2 is a transverse section of the same with the two sections thereof unfastened at one edge. Fig. 3 is a transverse section of said sections folded back to back. Fig. 4 is a side elevation of an improved form of my horn. Fig. 5 is a plan view of this latter horn laid flat. Fig. 6 is a perspective view of my preferred form of fastening for the edges of the

horn-sections, and Fig. 7 is a detail sectional view showing the manner in which the edges of the horn-sections are held by said fastening.

Turning to Fig. 1, it will be seen that the horn is composed of the two sections *a* and *b*, held together at the edges *a'* *b'* by a hinge *c*, preferably formed of fabric or leather. As shown, said edges overlap for a short distance, usually about half an inch, in order to preserve the true curve of the horn, as above set forth. For the same purpose the section edges *a''* *b''* are made to overlap for a similar distance and provided with fastenings *d* for securing them together. Such fastenings may be the common ball-and-socket devices used for gloves and purses, as indicated in the drawings. The hinge *c* is adapted to permit the two horn-sections to be folded back to back, as in Fig. 3, and thereby enable the same to lie perfectly flat.

In my preferred construction I divide the horn into six sections, as shown in Fig. 5, in order to enable the same to be folded into the smallest possible compass. The lines of severance for this purpose are three in number, *f*, *g*, and *h*, *f* and *g* running parallel to each other and *h* at right angles with the others. The last of said lines of severance *h* is adapted to be folded in either direction, but the lines *f* *g* are hinged substantially like that of the construction illustrated in Figs. 1, 2, and 3.

The fastening devices for the edges *a''* *b''* are formed, as shown in Figs. 6 and 7, where the thin base *k'* is provided with the thin flattened hook *k*. Said base is affixed to the under side of the edge *b''*, preferably by being stitched thereto, with the hook *k* reaching through a slit therein to the upper surface thereof. (See Fig. 7.) The mouth of this hook is arranged, as in Fig. 7, in order to receive the edge *a'* of the opposite section, and the opening is slightly constricted to receive said edge quite tightly, and thereby securely retain it.

In knocking down this horn the edge *a'* is first withdrawn from the grip of the fastenings *k*, then the sections 1 and 6 are folded over upon the sections 2 and 5, then the sections 3 and 4 are brought over upon the first-named ones, and, finally, the superposed sections 4, 5, and 6 are folded over upon the



combined sections 1, 2, and 3. The entire horn now occupies a space covering no more area than the single section 2, with a thickness equal to the six layers of the material composing the horn. Thus reduced in dimensions the horn can be packed in a very small compass and is hence capable of being carried from place to place in a small grip, a coat-pocket, or similarly-convenient receptacle. While this perfectly adapts the horn for use as a megaphone easy to be carried about and yet ready for use at a moment's notice, my preferable or most valued use for the same is in connection with phonographs. By packing this horn within the case arranged for the phonograph the entire talking-machine is complete, and yet occupies substantially no more space than the sounder mechanism alone. This is a most convenient arrangement for those giving phonograph entertainments at private parties or elsewhere necessitating the machine's being carried from place to place.

What I claim as my invention, and for which I desire to secure Letters Patent, is as follows, to wit:

1. In a collapsible horn, the combination of the sections formed of resilient material and hinged together along a substantially-longitudinal line, said hinge being adapted to permit said sections to be folded back to back but will compel flexure of the material itself when the free edges of the sections are brought together to form the horn, and fastening devices for said free edges, substantially as set forth.

2. In a collapsible horn, the combination of the sections formed of resilient material and hinged together along a substantially-longitudinal line, said hinge being formed of flexible material affixed to the edge of one section and a short distance back of the corresponding edge of the other section, whereby each overlapping edge is adapted to compel flexure of the material composing said sections when they are brought into the desired conical

form, and fastening devices for the free edges of said sections, substantially as and for the purpose set forth.

3. In a collapsible horn, the combination of the sections formed of resilient material and hinged together along a substantially-longitudinal line, and the fastening devices for the free edges of said sections, said fastening devices comprising the thin flat hooks having the bases affixed to the edge of one of said sections and adapted to receive and retain the edge of the other section, substantially as set forth.

4. In a collapsible horn, the combination of the plurality of sections formed of resilient material and shaped as shown, the flexible hinges securing the same together, and the fastening devices for the free edges of said sections, substantially as set forth.

5. In a collapsible horn, the combination of the sections formed of material capable of moderately-resisting flexure, the dividing-line between said sections being substantially longitudinal, and means for securing together the edges of said sections, such means being adapted to compel flexure of the sections themselves and thereby preserve the true conical shape of the horn, substantially as and for the purpose set forth.

6. In a collapsible horn, the combination of the sections formed of resilient material, the flexible hinges uniting said sections, and the fastening devices for securing together the exposed edges of said sections, two of the division-lines of said sections being parallel and substantially longitudinal therewith and the other at right angles to said parallel lines, substantially as set forth.

In testimony that I claim the foregoing invention I have hereunto set my hand this 14th day of June, 1899.

MAJOR D. PORTER.

Witnesses:

GUY H. HOLLIDAY,

A. B. UPHAM.



[**Defendant's Exhibit "N"**—**Letters Patent No. 699,928, to C. McVeety and J. F. Ford, Patented May 13, 1902.**]

[**Endorsed**]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "N." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "N." Received Aug. 19, 1913. F. D. Monckton, Clerk.



C. McVEETY &amp; J. F. FORD.

SHIP'S VENTILATOR.

(Application filed July 10, 1901.)

(No Model.)

FIG. 1.

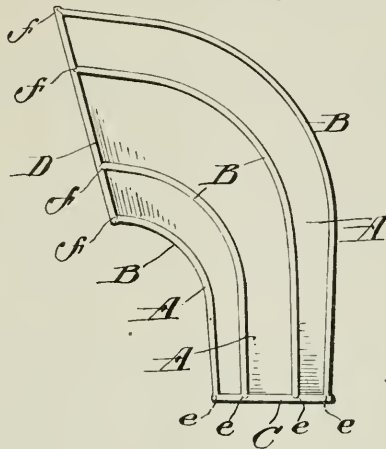


FIG. 4.

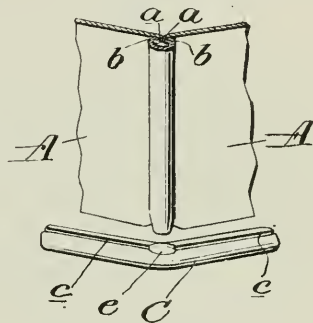


FIG. 2.

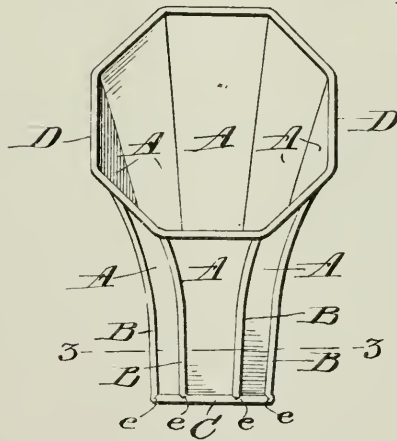
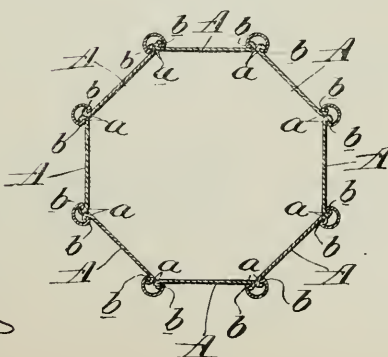


FIG. 3.



WITNESSES:

Roman S. Stealing  
Richard H. Sharp

INVENTORS

Charles McVeety  
John Ford  
by their attorney  
Walter W. Calhoun



# UNITED STATES PATENT OFFICE.

CHARLES McVEETY AND JOHN F. FORD, OF PHILADELPHIA, PENNSYLVANIA.

## SHIP'S VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 699,928, dated May 13, 1902.

Application filed July 10, 1901. Serial No. 67,714. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES McVEETY and JOHN F. FORD, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Ships' Ventilators, of which the following is a specification.

Referring to the accompanying drawings, forming part of this specification, Figure 1 illustrates a side elevation of a ventilator constructed in accordance with our invention. Fig. 2 represents a front elevation of the same. Fig. 3 shows a horizontal section on the line 33 of Fig. 2; and Fig. 4 represents a detached perspective view of a portion of the ventilator, showing the manner of uniting the parts.

The object of our invention is to construct a ventilator of that type known as "ships' ventilators" in the simplest and most economical manner, the plates of which the ventilator is made being stamped out in one operation, requiring no delicate bending and fitting, as is required in other types of ships' ventilators.

Referring to the reference-letters of the drawings, A A represent the plates, which are of varying width and provided at the sides with upturned portions *a*, forming grooves for the reception of the ribs B, which are in the form of split tubes, the inward-projecting portions *b* being adapted to engage the grooves of the plates A.

In Figs. 1, 2, and 3 of the drawings we have shown the ventilator constructed of eight plates or sections forming an octagonal figure in cross-sections and at the base and mouth. It will be understood, however, that any num-

ber of plates, as A, may be employed without departing from the scope of our invention.

As shown in Fig. 4, the plates A at the base and mouth of the ventilator are covered with beadings C and D, having slots *c* and *d* to receive the plates A and openings *e* and *f* to receive the ribs B. The beadings C and D are firmly secured by brazing metal to the plates A and ribs B.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A ventilator comprising in combination with a series of curved plates of gradually-increasing width having upturned edges forming grooves, a series of split tubes or ribs for engaging the grooves of said plates, and ribs arranged at the base and mouth having grooves engaging the plates and openings to receive the ribs substantially as specified.

2. A ventilator comprising a curved tapered pipe octagonal in cross-section composed of plates A, having upturned end forming grooves, ribs B in the form of split tubes for engaging and holding said plates in position, and ribs C and D arranged respectively at the base and mouth of the ventilator having slotted openings to receive the plates and openings for the ribs, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES McVEETY.  
JOHN F. FORD.

Witnesses:

C. P. S. GARWOOD,  
H. E. COUGHLIN.



**[Defendant's Exhibit "O"—Letters Patent No. 739,954, to G. H. Villy, Patented September 29, 1903.]**

[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "O." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "O." Received Aug. 19, 1913. F. D. Monekton, Clerk.





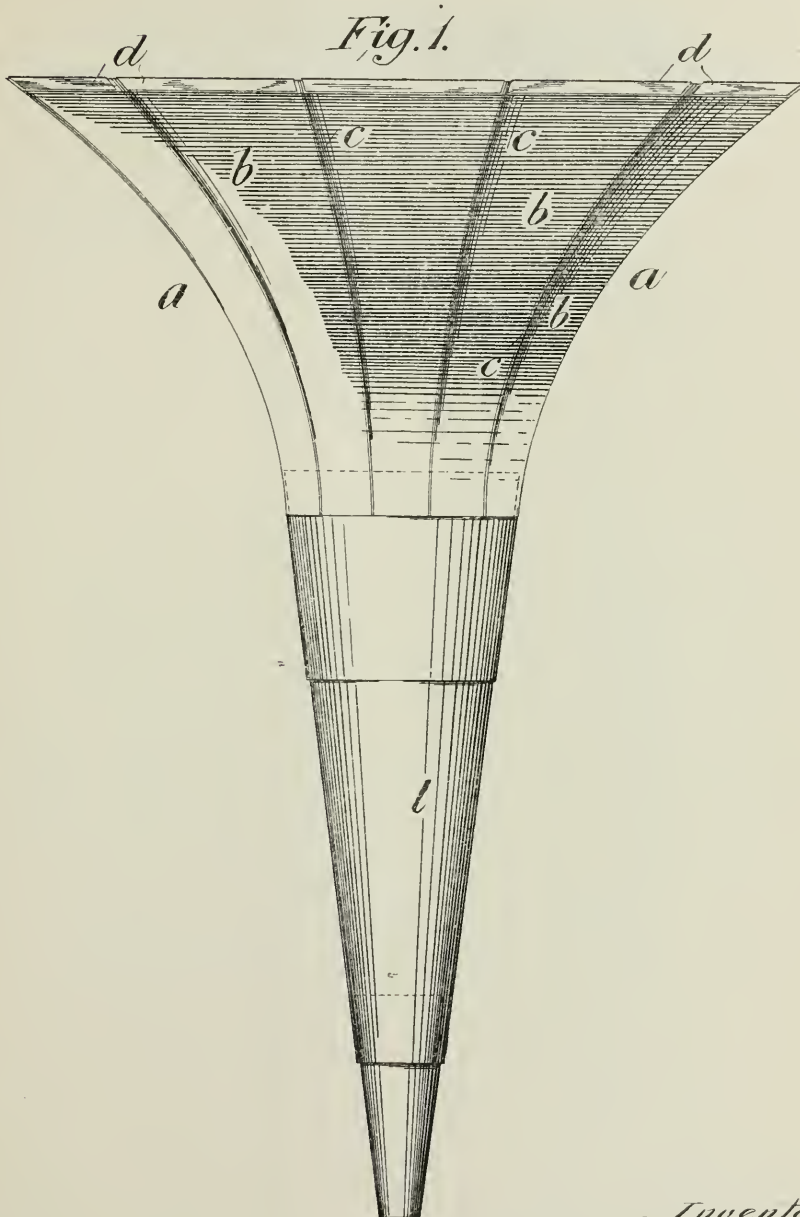
G. H. VILLY.

HORN FOR PHONOGRAPHS, EAR TRUMPETS, &amp;c.

APPLICATION FILED DEC. 8, 1902.

NO MODEL.

3 SHEETS—SHEET 1



Witnesses:  
*L. Hilton*  
*A. Veazie*

- Inventor -  
*Gustave H. Villy*  
By *H. B. Wilson & Co.*  
Attorneys -



G. H. VILLY.

HORN FOR PHONOGRAPHS, EAR TRUMPETS, &amp;c.

APPLICATION FILED DEC. 8, 1902.

NO MODEL.

3 SHEETS—SHEET 2.

Fig. 4.

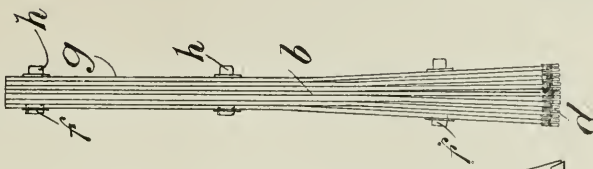


Fig. 3.

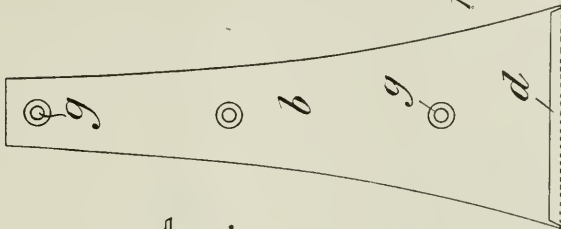


Fig. 6.

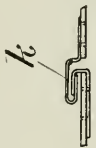
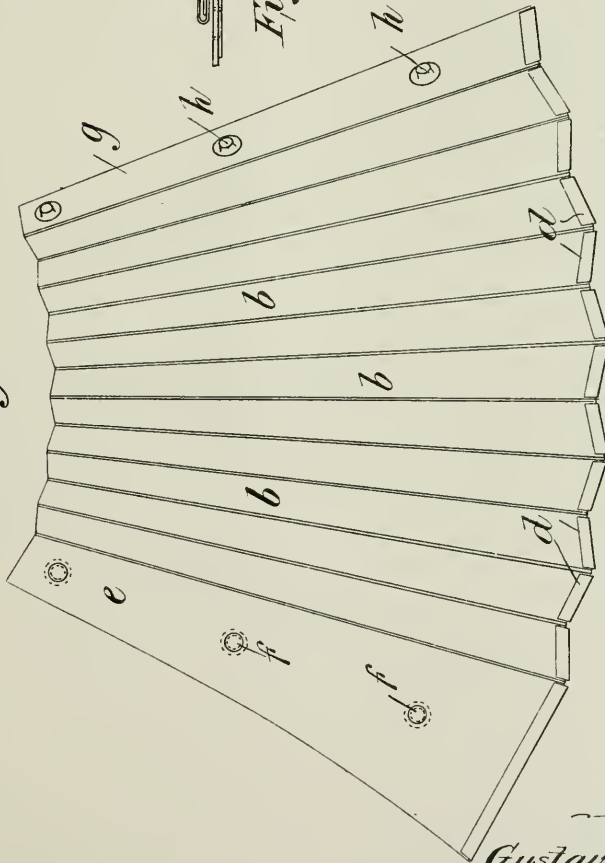


Fig. 2.



Witnesses:

L. Hilton  
A. Veazey

Inventor

Gustave H. Villy

By H. B. Villison &amp; Co.

Attorneys



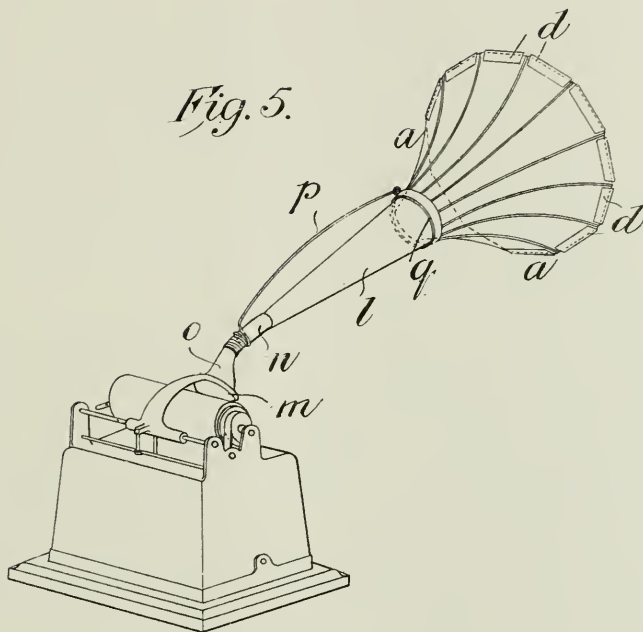
G. H. VILLY.

HORN FOR PHONOGRAPHS, EAR TRUMPETS, &c.

APPLICATION FILED DEC. 8, 1902.

NO MODEL.

3 SHEETS—SHEET 3.



Witnesses

*L. Hilton*  
*A. Veague*

Inventor—

*Gustave H. Villy—*

By *H. P. Wilson & Co*

*Attorneys*



# UNITED STATES PATENT OFFICE.

GUSTAVE HARMAN VILLY, OF MANCHESTER, ENGLAND.

## HORN FOR PHONOGRAPHS, EAR-TRUMPETS, &c.

SPECIFICATION forming part of Letters Patent No. 739,954, dated September 29, 1908.

Application filed December 8, 1902. Serial No. 134,413. (No model.)

### *To all whom it may concern:*

Be it known that I, GUSTAVE HARMAN VILLY, a subject of the King of Great Britain and Ireland, residing at 5 Longford Place, Longsight, Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Connection with Horns for Phonographs, Ear Instruments, and for Like Purposes, (for which I have made application for Letters Patent in Great Britain, No. 20,146, and dated 15th day of September, 1902,) of which the following is a specification:

This invention relates to improvements in connection with horns or trumpet-like sound distributors or collectors for use upon phonographs, gramophones, and other like instruments and also for ear-trumpets, fog-horns, and other sound distributing and collecting devices, the object being to provide a horn or trumpet-like device which can be folded when not in use, so as to be capable of ready transportation and for placing within the case of the phonograph or in the pocket of the user when it is to be applied to an ear instrument or the like.

The accompanying drawings represent one form of the invention.

Figure 1 is an elevation of the complete or erected horn. Figs. 2, 3, and 4 are detail views illustrating the manner in which the horn can be collapsed or folded. Fig. 5 is a perspective view illustrating one convenient application of the improved horn to a phonograph. Fig. 6 is a detail view on an enlarged scale.

In carrying my invention into effect in one convenient manner when making my folding horn for use, particularly in connection with a phonograph or like instrument, I make the end *a* of trumpet-like or curved configuration with an enlarged outer end and a smaller end at the interior of the conoidal-like form. I make this enlarged and trumpet-like device by employing a series of strips *b*, of paper, wood, linen, or other preferably flexible material, the foundations of which I prefer to make of linen or the like, so as to form a hinge-like connection *c* between each of the strips, the members *b* of which I arrange so that while lying close together when extended

there is a dividing-line between them about which they can be folded upon the base of linen or the like connecting-web upon which the paper or other material is mounted. The longitudinal hinged edges *c* of the flexible segments or sectors *b* are curved in such manner that although the segments when opened out cannot lie in the same plane they can either be folded together in a zigzag manner, so as to lie parallel to one another, as shown in Figs. 2 to 4, or extended by springing or buckling into the requisite trumpet or bell-like form, as shown in Figs. 1 and 5. The angles formed by the meeting of the hinged segments when extended form, as it were, ribs, giving rigidity to the trumpet form. The outer ends of the segmental-like strips I prefer to protect by a bent or turned-over edging *d* of metal, making the connection rigid by pressing a portion of the strip of metal or other binding material into the edge of the paper or the like foundation.

Upon the extreme member *e* of the series of strips *b* thus formed into one band I provide eyelets for other clip-like devices for enabling snap projections *h* on the opposite end strip *g* to be engaged therewith and when thus engaged to form a completed trumpet-like sound-distributor.

Instead of arranging eyelets or hook-like clips upon the outer members of the series of strips I may make one to engage with the other by forming a bead-like connection or flange *k* upon one member, into which the corresponding projecting or engaging portions of the other may enter, as shown in Fig. 6. When providing for an extension and a long funnel-like carrier for the built-up trumpet-like end *a* to engage with, I sometimes make a conical tube *l*, the enlarged end of which engages with the inner end of the trumpet-terminal *a*, while the smaller end of the cone engages with the receiver *m* of the phonograph or enters into the rubber or other tubular or flexible connection which may be employed for use upon any particular instrument. I prefer to make this extended or carrying member *l* for the collapsible trumpet from paper or other suitable material built up in a similar manner to that hereinbefore described to my collapsible end, or the



cone may be made in a short length in one piece, or it may be made telescopic when so desired.

When providing for a flexible connection at the extreme end of the cone *l*, I attach a length of rubber or the like tubing *n*, which I bind with metal or other band at the end for the purpose of inserting it upon the funnel *o* of the phonograph-reproducer, and I stiffen the combination trumpet and funnel with flexible end by providing one or more bars *p* of metal or the like stiffeners which support the funnel by means of elastic or other connections *q*, arranged upon the cone end and suspended from the projecting stiffening hook or members *p*, carried from the metal end or binder of the flexible tube *n*.

When constructing a funnel or tube for an ear-trumpet or for a fog or speaking horn or the like, I employ the same method of building up the segments to form the expanding-surface, modifying the arrangement of the inner end to suit the connection that is to be made therewith, so that when the trumpet is in use it can be extended and a large outer area exposed for the collection of sound and when not in use it can be folded, each segment upon the other, so as to occupy but little space—that is to say, a trumpet such as illustrated in Figs. 1 to 4 would be suitable as an ear-trumpet.

I am aware that it has hitherto been proposed to form conical or pyramidal horns from cardboard provided with a linen foundation; but such horns have been made up from a single flat scored sheet or from a number of flat triangular strips having straight edges. Such horns could be developed or laid out upon a flat surface. Owing to their formation if such horns were made collapsible they would have to be sustained in their conical form by additional sustaining means, or if they were made self-sustaining they could not be made collapsible. In contradistinction to this my collapsible horn could not be made up from a single flat sheet, as each strip has to be made with curved edges, and when the strips are flexibly secured together at such curved edges the whole or complete surface so formed cannot be laid out or developed on a flat surface. My horn, owing to the curvature of the edges of the strips, is self-sustaining and requires no additional stiffening or sustaining devices, although when it is desired to collapse the horn this may be effected by forcibly straightening and folding the strips one against the other in the manner hereinbefore described with reference to Figs. 2, 3, and 4. The horn when erected offers a decided resistance to such straightening or folding sufficient to render it self-sustaining against all ordinary shocks liable to be encountered; but it is found that when one strip has been forcibly straightened or folded

against another the equilibrium of the trumpet is destroyed and the whole may be easily collapsed.

I do not limit the application of my invention to any particular method of building up the segments or to any special curve or configuration of the same, and I vary the method of jointing and stiffening them to suit the material from which the strips are constructed and the foundation or base fabric upon which the flexible material forming the strips is secured.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A collapsible but self-sustained phonograph-horn, ear-trumpet or the like comprised of a number of flexible strips having curved meeting edges substantially as set forth.

2. A collapsible but self-sustained phonograph-horn, ear-trumpet or the like comprising a number of flexible strips having curved meeting edges and mounted on a flexible foundation, substantially as and for the purposes hereinbefore set forth.

3. A collapsible but self-sustained phonograph-horn, ear-trumpet or the like comprising a number of flexible strips having curved meeting edges, a flexible foundation for said strips and means for detachably securing the two extreme strips together, substantially as set forth.

4. A collapsible but self-sustained phonograph-horn, ear-trumpet or the like comprising a number of flexible strips having curved meeting edges, flexible connections between such edges and protecting means on the outer exposed edges, substantially as set forth.

5. A phonograph-horn, ear-trumpet or the like comprising a rigid conical tube and a collapsible trumpet-shaped mouth the latter being made up of a number of flexible strips having curved meeting edges, and flexible connections at such edges, substantially as hereinbefore set forth.

6. A horn of the class described comprising a rigid conical tube, and a collapsible trumpet-shaped mouth made up of a number of flexible strips having curved meeting edges, said mouth being connected to said rigid conical tube, substantially as described.

7. A horn of the class described comprising a rigid conical tube, and a collapsible trumpet-shaped mouth made up of a number of flexible strips having curved meeting edges, said mouth being telescopically connected to said conical tube, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

GUSTAVE HARMAN VILLY.

Witnesses:

DORA VILLY,

V. A. B. HUGHES.



[Defendant's Exhibit "P"—British Letters Patent No. 7594, to William Phillips Thompson, Patented April 24, 1900.]

2—390.

UNITED STATES OF AMERICA,  
DEPARTMENT OF THE INTERIOR,  
United States Patent Office.

To all to whom these presents shall come, Greeting:

THIS IS TO CERTIFY that the annexed is a true copy from the Bound Volumes of the Library of this Office of the Complete Specification and Drawings in the matter of the

British Letters Patent to  
William Phillips Thompson,  
Dated April 24, 1900,                      Number 7,594,  
for

Improvements in Graphophones or Phonographs.

IN TESTIMONY WHEREOF, I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this 25th day of November, in the year of our Lord one thousand nine hundred and eleven, and of the Independence of the United States of America the one hundred and thirty-sixth.

[Seal]

F. A. TENNANT,  
Assistant Commissioner of Patents.





*Date of Application, 24th Apr., 1900—Accepted, 23rd June, 1900*

# COMPLETE SPECIFICATION.

## Improvements in Graphophones or Phonographs.

A communication by GEORGE L. HOGAN, of the City of Baltimore, State of Maryland, United States of America, Electrical Engineer.

I, WILLIAM PHILLIPS THOMPSON, F.C.S., M.I.M.E., Agent for Foreign Patent Solicitors, 6, Lord Street, Liverpool, and 6, Bank Street, Manchester, both in the County of Lancaster, 118, New Street, Birmingham, in the County of Warwick, & 322, High Holborn, in the County of Middlesex, Civil Engineer,  
 5 do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This present invention pertains to improvements in graphophones or phonographs, the construction and advantages of which will be hereinafter set forth,  
 10 reference being had to the annexed drawings, wherein—

Fig. 1 is a side elevation of the machine as a whole;

Fig. 2, a top plan view;

Fig. 3, a perspective view of a portion of the trumpet and the reproducing point or stylus;

15 Fig. 4, a perspective view of the trumpet and its supporting arm;

Fig. 5, a transverse sectional view of a portion of the trumpet, showing the means employed for connecting its edges;

Fig. 6, a similar view illustrating a modified form thereof;

Fig. 7, a side elevation, partly in section, of a modified form of trumpet, and

20 Fig. 8, a side elevation of a record-supporting spool or holder, with the sound record shown in section thereon.

The main object of this invention is to produce a simple, cheap, and yet highly efficient phonograph.

With the construction hereinafter described, many advantages present themselves, more particularly in the method employed for imparting motion by  
 25 hand to the sound record, whereby an even application of power is obtained; and again, in the manner in which the trumpet is secured together, and further, in the means employed for supporting the trumpet, all of which will be set forth in detail.

30 Other objects and advantages will appear in the following description.

Referring first to Figs. 1 and 2, A denotes the base or main frame of the instrument, supported upon two fixed legs B, B, and an adjusting screw C by means of which the base may be brought to its proper level position.

Rising from the base, preferably at one side thereof, is an upright arm or  
 35 member D in the rear upper portion of which there is formed an upwardly and rearwardly extending slot E, while a similar slot is formed in a corresponding arm upon the opposite side of the base. These slots constitute the supports or bearings for the ends of the axle F of the record spool G. The axle may be formed in one piece and extend from end to end of the spool, or it may com-  
 40 prise simply two short pins secured in the ends of the spool.

[Price 8d.]

As will be noted upon reference to Figures 2 and 8, the spool or support G is provided at one end with a pulley H.

Mounted and fixed upon a suitable axle journalled in the forward portion of the upright wall or member D, is a band pulley I, while connected to the outer end of said axle is a crank I<sup>1</sup> for imparting motion thereto. A second axle is secured in the upright member D, and upon this is loosely mounted a small pulley J, having formed integral therewith or connected thereto a fly-wheel K.

Suitable elastic bands L, such for instance as rubber, connect the pulleys I and J, and pulley J with the pulley H of the record spool or support.

Where power is applied to the crank by hand, it is next to impossible to turn the same with that evenness which is necessary to the best results in a phonograph,—especially so where a musical record is being used. By reason of the yielding of the elastic bands, which work in conjunction with the fly-wheel, the motion which is imparted to the record support or spool is quite even. In other words, should the operator give a sudden jerky motion to the crank, it will not be imparted to the record, but will be taken up and absorbed in a great measure by the yielding of the band or bands. By the use of elastic bands, the record or record support may be easily withdrawn from its bearings, and a new one introduced. The elastic band, working on the record support, serves to hold said support to its proper place relative to the bearings or slots E.

For the sake of lightness and appearance, the central portion of the base is cut away or left open in the process of manufacture; and extending forwardly from this open portion is a slot M, preferably closed at its forward end.

N denotes the trumpet support, which is preferably of the form illustrated in Figures 1 and 4; that is to say, comprises a long, tapering arm carrying at its forward end an upwardly extending point or finger O. The opposite end of the support extends down and is broadened out somewhat, presenting a flat bearing surface which rests upon the base at each side of the slot when the parts are assembled.

To maintain the parts in place, the support is provided with a downwardly extending T-shaped member P, the body of which passes through the slot, while the laterally extending arms engage the under face of the base,—see Fig. 1. To prevent any lateral or sidewise movement of the support, a downwardly extending stud or lug Q is also provided, which projects into the slot, as indicated in dotted lines in Figure 1. From this it will be seen that the support is firmly held in its proper relation to the base, that it may be adjusted back and forth in the slot, and may be readily detached and removed from the base when it is desired so to do.

R denotes the trumpet, the body of which is made of relatively thin, tough paper, papier-mâché, indurated fibre, isinglass, gelatin, or preferably, celluloid, formed of a single piece and having its edges joined together by a strip of sheet-metal in the manner illustrated in Fig. 5, or that shown in Fig. 6. In place of the sheet-metal binding strip a strip of celluloid, formed so as to embrace the adjacent edges of the sheet may be used, in which case the binding strip and the edges of the sheet will be held together by celluloid glue, or some similar material.

In Fig. 5 it will be seen that the edges of the trumpet overlap one another and are embraced between the folds of the reversely turned edges of a sheet-metal strip or a strip of celluloid, said strip extending from end to end of the trumpet, as is clearly indicated in Figs. 1 and 4.

In Fig. 6 two pockets are formed in the binding strip by bending it as shown, that is to say, by first bending the edges of the strip toward the centre of the body, and then outwardly again upon the inturned portion, the edges of the trumpet body being inserted into the spaces or pockets thus formed.

With both forms of connecting device, when the parts are assembled, a suitable cement is employed to ensure close contact and firm adhesion,—in the case of the metal strips, said strips and the edges of the trumpet are of course squeezed



*Thompson's Improvements in Graphophones or Phonographs.*

together or otherwise brought into close and intimate contact, so that there can be no independent vibration of the parts one relatively to the other.

Celluloid is perhaps the best material which can be employed in the construction of a trumpet, particularly for the class of machines similar to that herein  
5 shown and described. It is light, and when built up in the manner described, is highly resonant, is durable, cheap, and also possesses many other advantages which are apparent to any one familiar with this art.

While the trumpet has been shown in connection with a particular form of phonograph, still it is apparent that it may be used with any type of machine  
10 to great advantage.

Soldered or otherwise secured to the forward end of the binding strip S is an arm T, the main body of which stands at a slight distance from and parallel to said binding strip. It is provided throughout its length with inturned or locking edges U adapted and designed to engage with similar outwardly turned  
15 edges of a U-shaped member V. In the lower side of said member V there is formed an opening W through which the finger O of the supporting arm extends, the upper pointed end of said arm bearing against the under face of the arm T, as indicated in Fig. 1. The opening W is of such size as not to bind upon the arm or finger O, but to permit a slight free movement of the parts.

At or near the rear end of the binding strip S, there is secured by solder or otherwise, a holding and clamping device for the point or stylus X of the graphophone. Said clamping device comprises two spring arms Y and Z, the arm Y being nearest to the strip, while the arm Z which is somewhat longer,  
20 stands in a plane below the arm Y and has secured to it a rounded support or seat a.

The reproducing point or stylus X, in the form shown, comprises a short section of glass tubing or rod, having one end closed, if a tube, and drawn down to a point to form the working point, while the body thereof surrounds the arm Y and rests upon the support a, as is most clearly shown in Fig. 3.

Interposed between the binding strip S and the upper-face of the body of the stylus or reproducing point, is a cushion b, preferably formed of leather or a somewhat similar yielding substance.

From the foregoing it will be seen that the stylus may be moved back and forth upon its support, so that its point may be projected beyond the end of  
35 the trumpet, as indicated in Figs. 3 and 4, or may be directly below the trumpet as indicated in Figs. 1 and 2.

The record support (shown in Fig. 8) is cut away throughout the major portion of its length to render it light in weight, while at the same time it affords a sufficient bearing at each end for the record or cylinder employed.

In Fig. 7 a modified form of the trumpet is shown, which, instead of being a true cone or a frustum of a cone, consists of a main portion c, which may be a true cone or a frustum of a cone having connected to it two or more sections d e each of which is a frustum of a cone made upon a different angle from each other and from the main body so as to produce a flaring-shaped trumpet. The various  
45 sections of the trumpet will be made of the material before mentioned, and will be connected throughout their length by fastenings similar to those shown in Figs. 5 and 6. The adjacent or abutting ends of the various sections will have secured upon them metal strips or bands f, which will embrace the ends and which strips in turn will be soldered or brazed to each other entirely around  
50 the trumpet. The outer end of the trumpet will also preferably be provided with a sheet-metal strip or ring securely held thereon by some cementitious substance and pressure, as above described in connection with the binding strip S.

While my correspondent has shown and described this modified form of trumpet  
55 as being made up of a series of cone frusta, it is of course possible to make it up of a series of pyramid frusta, though, from many points of view, the conical form is preferable.

*Thompson's Improvements in Graphophones or Phonographs.*

From the foregoing description it will be seen that when the parts are assembled, the trumpet will swing upon the finger O and that the stylus or point X will follow the sound writings upon the cylinder or other sound record being used. By reason of the adjustability of the arm or trumpet support N the stylus or point can be brought to its proper position relative to the cylinder so that the best results may be obtained. It will be noted that the supporting member V is also adjustable with relation to the arm U, and that a certain degree of elasticity is present in said arm U. By these adjustments the proper degree of pressure necessary to be had upon the reproducing point is secured, and the parts may be adjusted with a nicety which is requisite to the best results. 5 10

A variation in the character of the sound reproduced may also be obtained by adjusting the stylus back and forth with relation to the trumpet.

While my correspondent has shown an apparatus designed to be driven by hand, it is manifest that instead of the mechanism illustrated, a spring or other motor may be employed for imparting the necessary rotation to the spool G which supports the record. 15

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, as communicated to me by my foreign correspondent, I declare that what I claim is:—

1. In a phonograph, the combination of a suitable base; arms extending upwardly therefrom; a rearwardly extending slot formed in each of said arms; a record support provided with axles extending from its ends and adapted to rest in said slots; and means for imparting motion to said support. 20

2. In a phonograph, the combination of a suitable base; arms extending up therefrom; a rearwardly extending slot formed in each of said arms; a record support journaled in said slots; a driving pulley; and elastic connections intermediate said pulley and the support for imparting motion to the latter, substantially as described. 25

3. In a phonograph, the combination of a suitable base; a record support journaled thereon; a power pulley; and elastic connections intermediate said pulley and the record support for imparting motion to the latter, substantially as and for the purpose described. 30

4. In a phonograph, the combination of a suitable base; a record support journaled thereon; a power pulley; a fly-wheel; and elastic connections intermediate the record support, the fly-wheel, and the power pulley, substantially as and for the purpose described. 35

5. In a phonograph, the combination of a suitable base; means for holding a sound record rotatably thereon; a source of power; a fly-wheel; and elastic driving bands connecting the record-holding means and the fly-wheel, and said fly-wheel and the source of power. 40

6. In a phonograph, the combination of a suitable base; arms or supports extending up therefrom, each provided with an upwardly and rearwardly inclined slot; a record support having its bearings resting in said slots; a power pulley I; a pulley J located intermediate said pulley I and the record support; a fly-wheel working with said pulley J; and elastic bands L connecting the power pulley I and the record support with pulley J. 45

7. In a phonograph, the combination of a suitable base; a record support carried thereby; a trumpet; and an adjustable support for the trumpet mounted upon the base.

8. In a phonograph, the combination of a suitable base; a record support carried thereby; a trumpet; and a yielding support for the trumpet, substantially as described. 50

9. In a phonograph, the combination of a suitable base; a record support carried thereby; a trumpet; and an adjustable and yielding support for the trumpet, substantially as described. 55

10. In a phonograph the combination of a suitable base; a record support

*Thompson's Improvements in Graphophones or Phonographs.*

carried thereby; a trumpet; an adjustable support for the trumpet mounted on the base; and means for adjusting the level of the base.

11. In a phonograph, the combination of a suitable base; a record support carried thereby; a trumpet, an adjustable and yielding support for the trumpet; and means for adjusting the level of the base.

12. In a phonograph, the combination of a suitable base; a record support carried thereby; a trumpet pivotally supported at its outer end and having its inner end above the record support; and means for adjusting the level of the base; substantially as and for the purpose described.

13. In a phonograph, the combination of a suitable base; a record support carried thereby; a trumpet; and means carried by the base for adjusting the trumpet toward and from said support, substantially as described.

14. In a phonograph, the combination of a suitable base; a record support; a trumpet; an arm adjustably connected to the forward end of said base and extending out therefrom; and pivotal connections intermediate said arm and the trumpet, whereby the rear end of the trumpet may be adjusted with relation to the record, and is free to move both laterally and vertically, substantially as described.

15. In a phonograph, the combination of a suitable base; a record support; a trumpet; an arm adjustably connected to the forward end of said base and extending out therefrom; a finger extending up from said arm; and connections, substantially as described, between said finger and the trumpet.

16. In a phonograph, the combination of a suitable base; a record support carried thereby; a slot formed in the forward portion of the base; an arm provided with means working in conjunction with the slot for adjustably attaching said arm to the base; a finger O extending up from the forward end of arm N; a trumpet; an arm U connected to the under side of the trumpet; and a member V connected to said arm and provided with an opening through which the finger O extends.

17. In combination with a phonographic trumpet, a point or stylus connected thereto, said stylus comprising a section of glass tubing or rod drawn to a point at one end.

18. In combination with a phonographic trumpet, a reproducing point or stylus, said stylus comprising a section of glass tubing or rod drawn to a point at one end; means for holding the stylus in close contact with the trumpet; and a cushion interposed between the stylus and the trumpet.

19. In combination with a phonographic trumpet, a reproducing point or stylus, comprising a section of glass tubing or rod drawn to a point at one end; a support for said stylus, consisting of two arms Y and Z attached to the trumpet; and a cushion intermediate the tube and trumpet, substantially as described.

20. In combination with a phonographic trumpet, a reproducing point or stylus, comprising a section of glass tubing or rod drawn to a point at one end; a support for said stylus, comprising two arms Y and Z; a bearing *a* attached to said arm Z; and a cushion interposed between said stylus and the trumpet.

21. In combination with a phonographic trumpet, a reproducing point or stylus, comprising a section of glass tubing or rod drawn to a point at one end; and means for adjustably connecting the stylus to the trumpet, substantially as described.

22. A trumpet for phonographs, composed of a single sheet of resonant material having its edges clamped and held together by a single strip of metal or the like, substantially as described.

23. A trumpet for phonographs, composed of a single sheet of resonant material bent to form, and having its edges treated with a cementitious substance and held together by a single strip of metal or the like bent around them, substantially as described.

24. A trumpet for phonographs, comprising a single sheet of resonant



*Thompson's Improvements in Graphophones or Phonographs.*

material bent to form; and a strip of metal shaped to form pockets adapted and designed to receive and hold the proximate edges of the sheet, substantially as described.

25. A trumpet for phonographs, comprising a main body portion composed of a single sheet of resonant material bent to form, and having its proximate edges secured together; and an additional flaring section secured to the outer end of the main body, said flaring section being likewise formed of a single sheet of resonant material having its proximate edges secured together, substantially as described. 5

26. A trumpet for phonographs, comprising a main body portion and a series of connected sections attached to the large end of the body portion, each succeeding section having its walls more flaring than those of the preceding one, substantially as described. 10

27. A trumpet for phonographs, comprising a main body portion and a series of connected sections attached to the large end thereof, each succeeding section having its walls more flaring than those of the preceding, and the main body and each of the sections being each formed from a single sheet of fibre having its proximate edges secured together by a strip of metal or the like, substantially as described. 15

28. A trumpet for phonographs, comprising a main body portion conical in form and composed of a single sheet of resonant material having its proximate edges secured together by a strip of metal or the like; and a series of connected sections attached to the large end of the main body, each succeeding section being in outline a frustum of a cone, having a larger base than the preceding and each formed of a single sheet of resonant material having its proximate edges connected by a metal strip or the like, substantially as described. 20 25

29. A supporting spool for phonographic sound records having its central portion cut away or reduced in diameter, and having a pulley formed at one end thereof, substantially as described.

30. A trumpet for phonographs or the like, composed of celluloid or its described equivalent. 30

31. A trumpet for phonographs composed of a sheet of celluloid bent to form and having its proximate edges secured together in a manner substantially as herein set forth.

Dated this 23rd day of April 1900.

35

WM. P. THOMPSON & Co.,  
Agents.



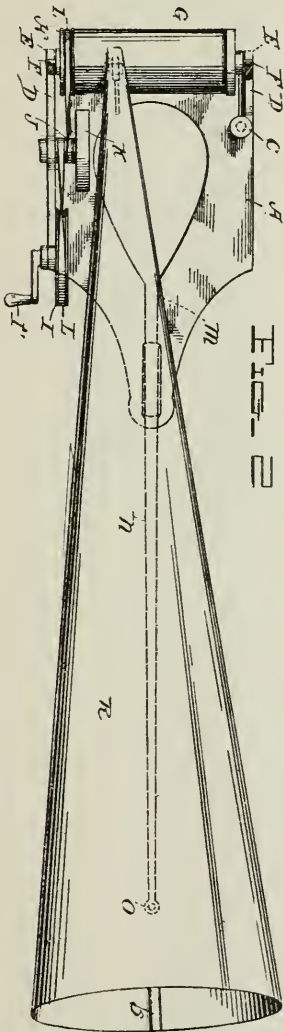
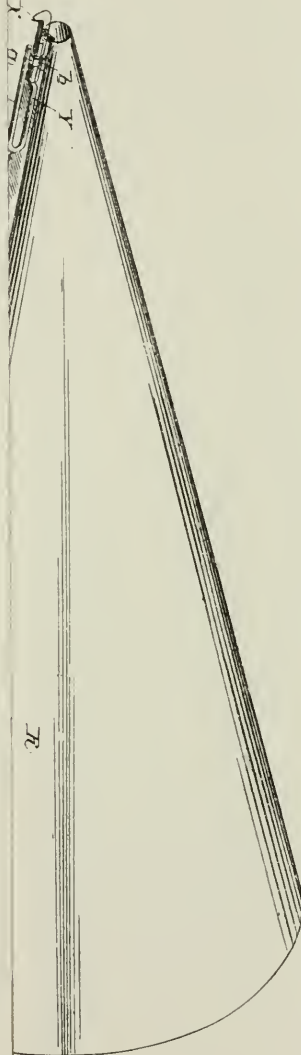


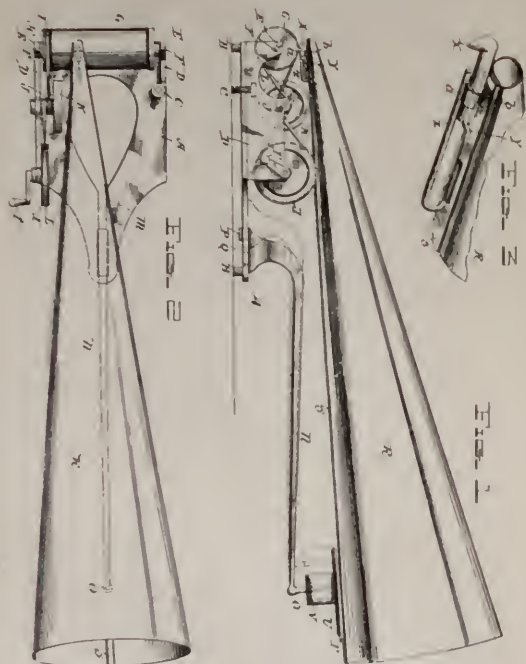
FIG. 2



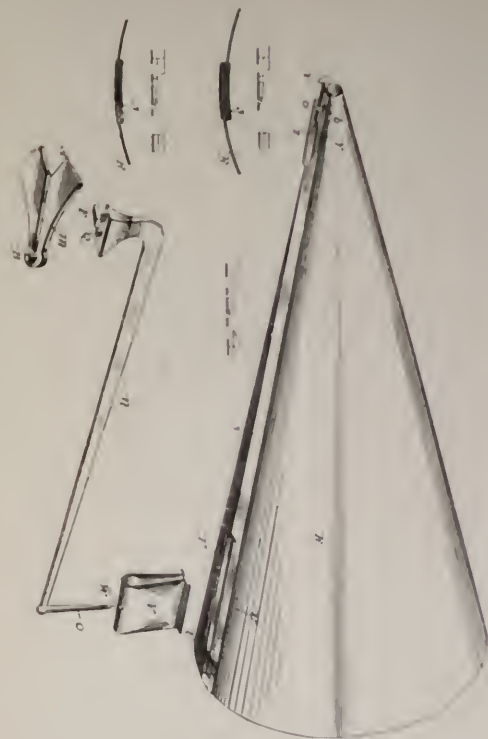
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SHEET 1



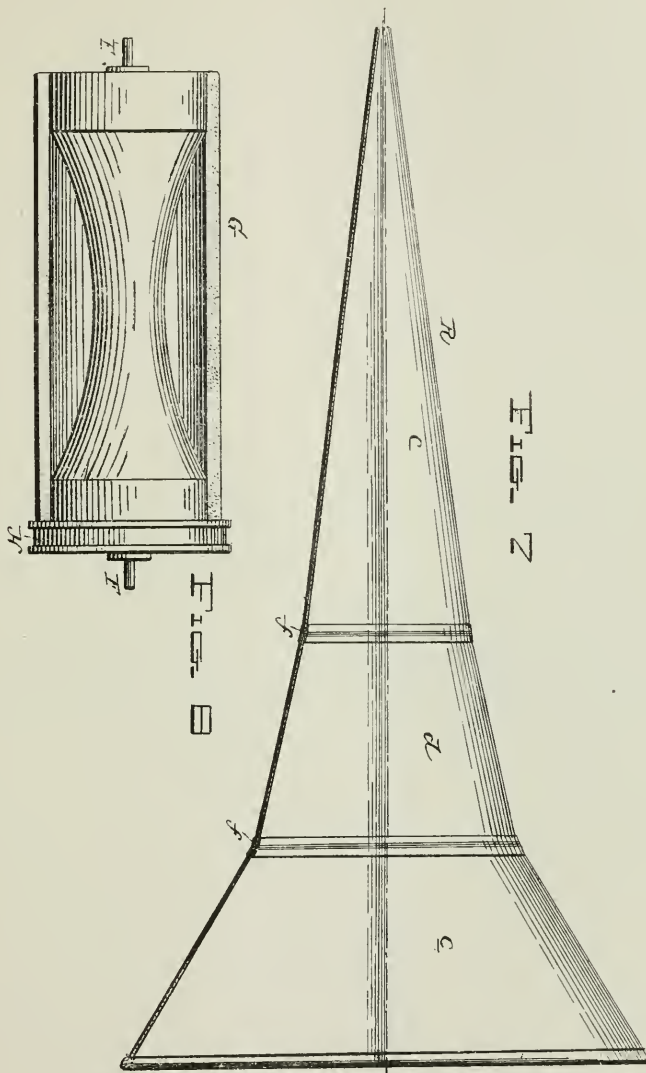
SHEET 2



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[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "P." Oct. 2, '12. W. B. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "P." Received Aug. 19, 1913. F. D. Monckton, Clerk.

[Defendant's Exhibit "Q"—British Letters Patent  
No. 20,567, to John Mesny Tourtel, Patented  
September 20, 1902.]

2—390.

UNITED STATES OF AMERICA,  
DEPARTMENT OF THE INTERIOR,  
United States Patent Office.

To all to whom these presents shall come, Greeting:

THIS IS TO CERTIFY that the annexed is a true  
copy from the Bound Volumes of the Library of this  
Office of the Provisional Specification, Complete  
Specification and Drawings in the matter of the

British Letters Patent to  
John Mesny Tourtel,

Dated September 20, 1902,                      Number 20,567,  
for

Improvements in Phonographs.

IN TESTIMONY WHEREOF I have hereunto  
set my hand and caused the seal of the Patent Office  
to be affixed at the City of Washington, this 25th  
day of November, in the year of our Lord one thou-  
sand nine hundred and eleven, and of the Independ-  
ence of the United States of America the one hun-  
dred and thirty-sixth.

[Seal]

F. A. TENNANT,  
Assistant Commissioner of Patents.





*Date of Application, 20th Sept., 1902*

*Complete Specification Left, 18th June, 1903—Accepted, 20th Aug., 1903*

## PROVISIONAL SPECIFICATION.

### "Improvements in Phonographs"

I, JOHN MESNY TOURTEL of 146A Queen Victoria Street, London E.C. Consulting Engineer, do hereby declare the nature of this invention to be as follows:—

My invention relates to improvements in or relating to phonographs. These improvements are primarily devised to render more efficient and satisfactory that type of apparatus in which a horizontal cylinder revolved by suitable apparatus, forms the support for the hollow cylindrical record, and the horn rests upon the surface of the said record by means of a stylus attached to its small end, which stylus follows the helical line traced by the recording point upon the surface of the record cylinder and thus reproduces the sounds inscribed thereon.

My improvements in this apparatus relate to the following points of the construction.

#### THE COVER.

In place of the exposed cylinder and partially exposed driving mechanism hitherto employed, I have devised a cover so arranged that all the working parts of the mechanism are enclosed without hindrance to their satisfactory operation. My cover which is of any convenient shape and preferably of sheet metal, is attached to the base plate of the mechanism by means of a long pin or bolt passing vertically upwards and provided with a milled nut, which nut is screwed upon the threaded end of the bolt which passes through the hole in the top of the casing. Similar apertures at the sides enable the insertion of the key and of the check screw, which prevents the revolution of the driving shaft. The end of the casing surrounding one end of the revolving cylinder is open and the record can be slipped into its place or removed therefrom without disturbing the cover. The cover is moreover slotted at the top, above the record, the said slot being of sufficient width to allow for the travel of the stylus from one end to the other of the record. By means of this cover, the working parts are efficiently enclosed, and the appearance of the apparatus is greatly improved.

#### THE HORN.

The horn may be made of sonorous material in the well known manner. At the small end thereof, the stylus is cemented in or fastened to a plug fitted in the point of the said horn. I find that the preferable method of attachment is to cement the said stylus by means of a fabric and gelatine, or the like cement, to the material of which the horn is composed. But any other suitable cement may be employed whereby the stylus can be securely attached to the aforesaid plug, and this in turn intimately secured to the end of the horn. A further improvement relating to the horn consists in the means of supporting the same and imparting to it a sufficient pressure to cause the stylus to rest firmly upon the record. The horn itself being extremely light in proportion to its bulk, does not afford sufficient pressure by its weight alone. I therefore secure to the preferably metallic mouthpiece of the horn, a socket

[Price 8d.]

working in pivots and adapted to fit over a bent wire or the like support which is arranged to fit in a hollow socket formed by perforating one of the supporting feet of the base plate. The socket attached to the horn by its pivots is also attached to it by means of a spiral spring fixed in such a position that when the apparatus is in position with the socket upon the wire support and the stylus upon the record, the said spiral spring will be extended to the required degree to give the necessary downward pressure to the horn and thereby ensure the close contact of the stylus with the record. 5

#### THE STYLUS.

This portion of the invention is improved as follows. I provide a long stylus of suitable material. This stylus may be a solid one or it may be more conical in shape than that hitherto in use, and hollow internally. In either case, the length of the stylus is considerably increased over the ordinary construction, and the top of it is formed in the shape of a disc or ring, intimately attached to the diaphragm of the horn. 10 15

#### THE SUPPORTS

In my improved construction, I provide firstly a support for the point of the stylus when the apparatus is out of operation. By this means, I can without dismounting the machine or leaving the stylus resting upon the record, or without providing another support for the horn, place the instrument instantaneously out of operation and return it to the working position again, equally quickly. The support for the stylus, consists of a little cup or box of any convenient shape, preferably secured to the top of the cover at one end of the slot for the stylus, already described. The bottom of this cup or receptacle is formed of some soft material, such as soft rubber, and upon this the point of the stylus can rest without injury. The supports of the base plate are formed in the shape of legs, preferably cast in one piece with the said plate, and three in number. On one of these legs is a hollow socket provided with a milled ridge on the outside, and internally threaded to fit the threaded foot cast in one piece with the plate. This socket serves to adjust the level of the apparatus. The front foot is formed hollow and serves as the socket for the end of the bar or wire supporting the horn. The upper edge of this socket is preferably notched to receive the cross pin in said support thereby holding the same rigidly in one position. The third leg may be adjustable or not, as desired. 20 25 30 35

Although in the foregoing, I have set forth the construction as found preferable at the present time, I do not limit myself to the details therein set forth; thus for instance, I may have more than three supporting legs, or I may attach my cover otherwise than by the long bolt described, and other alterations of design may be made, which are within the capacity of an experienced mechanic. But such alterations of the detail of the apparatus will remain within the scope of my invention herein set forth. 40

Dated the 20th day of September 1902

W. P. THOMPSON & Co.,  
322, High Holborn, London, W.C. 45  
Patent Agents.

#### COMPLETE SPECIFICATION.

#### "Improvements in Phonographs".

I, JOHN MESNY TOURTEL, of 146A Queen Victoria Street, London, E.C. Consulting Engineer, do hereby declare the nature of this invention and in what 50

*Tourtel's Improvements in Phonographs.*

manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

My invention relates to improvements in or relating to phonographs. These improvements are primarily devised to render more efficient and satisfactory  
 5 that type of apparatus in which a horizontal cylinder revolved by suitable apparatus, forms the support for the hollow cylindrical record, and the trumpet rests upon the surface of the said record by means of a stylus attached to its small end, which stylus follows the helical line traced by the recording point upon the surface of the record cylinder and thus reproduces the sounds in-  
 10 scribed thereon.

In order to make my invention more clear, I have illustrated it in the accompanying drawings in which

Figure 1 shews a side elevation of the apparatus in the operative position.

Figure 2 shews a plan view of the same.

15 Figure 3 shews an isometric view on a reduced scale of the cover.

Figure 4 illustrates a section of the trumpet on the line X—Y of Figure 1.

Figure 5 shews the stylus on an enlarged scale in section.

Figure 6 shews another construction of stylus, in section through the stylus and the resonator drum to which it is attached.

20 In these drawings, A indicates the base plate, B the detachable cover, C the cylindrical record, D the trumpet, E the trumpet support. The base plate A may be of cast metal and supports a mechanism for giving rotary motion to the cylinder I, on which the cylindrical record C can be slipped; the aforesaid mechanism forming in itself no part of my invention, is not specifically illus-  
 25 trated in the drawings, it may be of any suitable or known type. The base plate A has preferably two rear legs and one front leg arranged as shewn in dotted lines in Figure 2. One of the rear legs 2 is an ordinary cast iron leg, The other one is preferably a threaded bolt and somewhat shorter than its corresponding leg, but covered with a hollow socket 3 provided with a milled  
 30 ridge or other convenient means for readily revolving it, and threaded internally to screw upon the threaded leg 2. By this means, an easy adjustment for levelling the apparatus is provided. The front leg 4 is hollow and forms a socket for the trumpet support E. This trumpet support is preferably constructed (as shewn in Figure 1 of the drawings) with a little cross pin 5 adapted  
 35 to engage in a corresponding notch in the top of the hollow socket 4, thereby holding the rod or wire E firmly in place. Over the upper end of the rod E the socket 6 is arranged to fit. This socket is attached to a rim 7 of the trumpet D by means of the pivots 8. The socket 6 is attached to the trumpet D by means of the spiral spring 9 for the purpose hereinafter described.

40 The novelty of the construction of the trumpet resides in the arrangement for strengthening the same by the reinforcement of its lower part in the manner especially illustrated in Figure 4. The material of the trumpet which may be conveniently celluloid, or any other sufficiently light and resonant material, is curved to join at the edges into the form required, said join being  
 45 in the shape of a V-shaped ridge running the entire length of the trumpet from the lower edge of the rim to the junction with the stylus. By this construction, the need of any special strengthening bars or reinforcement of other materials is obviated.

The stylus shewn in Figure 1 and sectionally in Figure 5 is formed of a  
 50 curved tube terminating in a point and fitting in a wooden plug in the apex of the trumpet. Another form of stylus is shewn in section in Figure 6. It is preferably of a hard material such as glass or metal. It is formed of greater length than the stylus hitherto in use. To diminish its weight and render it more sensitive, it is formed hollow and is attached to the drum 12 by means of  
 55 the annular or disc-shaped head 11. The junction of the drum or resonator 12 to the trumpet D is preferably by means of a fabric soaked in gelatine, cement or glue, but any other suitable cement may be employed.



The cover B is so contrived that it can be removed from the apparatus or replaced without interfering with any of the working parts. Its general construction is illustrated in Figure 3.

The end of the cylinder 1 is arranged to project slightly through the circular aperture 13 leaving a convenient space for the manipulation of the cylindrical record which can then be inserted or exchanged without moving the cover. Above the record, there is provided the slot 14 which accords access to the surface of the record for the stylus. At one side of the cover is provided the receptacle 15 having a soft pad or plug of rubber or the like at the bottom thereof, and adapted to receive the point of the stylus when the instrument is out of operation. By means of this holder, the ordinary supporting fork and other more complicated devices are rendered unnecessary. The casing is formed preferably in one piece and is secured to the base plate A by means of a single bolt 16 having a threaded end and a milled nut 17 thereon. Other apertures are provided for the insertion of the winding key 18 on the one side, and of the check screw 20 on the other.

The general operation of the phonograph is well known and need not be here described.

The record having been placed in position upon the cylinder 1, the cover B being in place and the driving mechanism started, the stylus 10 is lifted out of its receptacle 15 and put in place through the slot 14 of the cover. In addition to the weight of the trumpet D, the stylus is further impelled against the surface of the record by the action of the spiral spring 9, according to the strength of which the stylus will be more or less pressed upon the revolving record. The sounds caused by the inscriptions on the record are thus transmitted through the resonator to the trumpet and given forth. The apparatus can be easily taken to pieces for packing or removal and as easily reinstated, the cover which entirely protects the moving parts being attached to the base by only one screw.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a phonograph: a casing covering the mechanism and record having an aperture corresponding to the end of the record through which the said record can be removed or replaced without disturbing the casing, substantially as set forth.

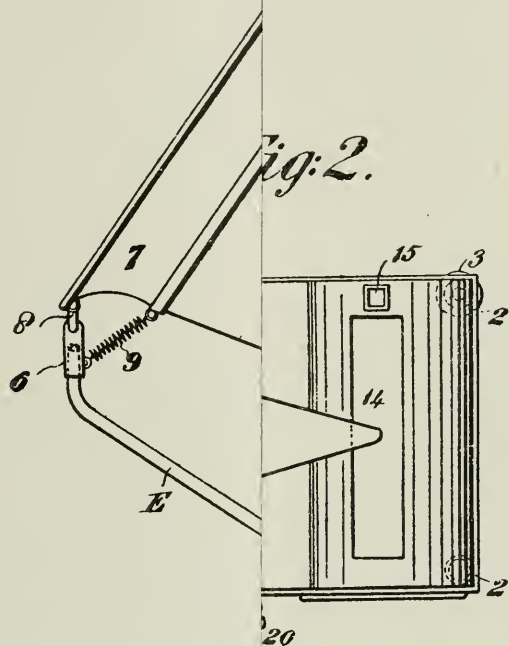
2. In a phonograph: a casing adapted to cover the mechanism and the record whilst allowing the record to be interchanged without disturbing the casing, said casing secured to the base of the mechanism by a single long bolt and provided with a pad or support for the stylus of the trumpet when out of contact with the record, substantially as set forth.

3. In a phonograph: the adjustable support E for the trumpet socketted in the hollow front leg of the base, substantially as set forth.

4. The combination and arrangement of parts forming the improved phonograph constructed and operating substantially as described and illustrated in the accompanying drawings.

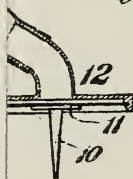
Dated the 18th day of June, 1903.

W. P. THOMPSON & Co.,  
322, High Holborn, London, W.C., and  
6 Lord Street, Liverpool.  
Patent Agents for the Applicant.



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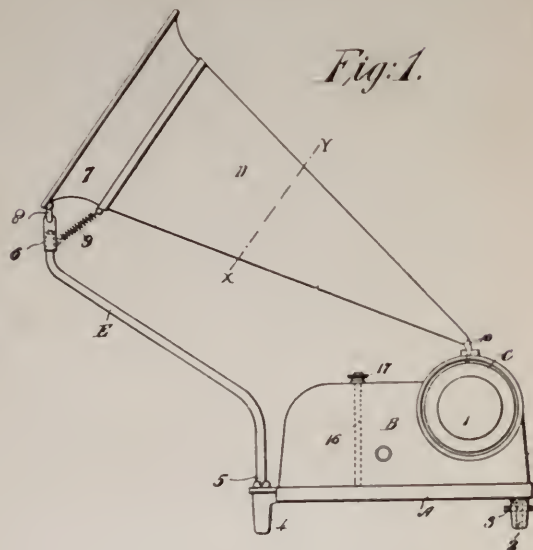
*Fig. 6.*



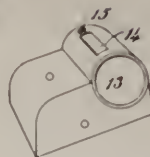
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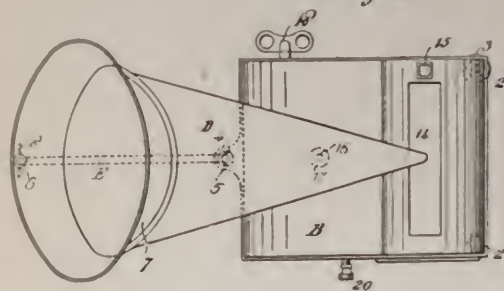
*Fig. 1.*



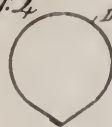
*Fig. 3.*



*Fig. 2.*



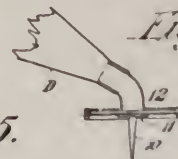
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*







[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "Q." Oct. 2, '12. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "Q." Received Aug. 19, 1913. F. D. Monckton, Clerk.



[Defendant's Exhibit "R"—British Letters Patent No. 17,786, to Henry Fairbrother, Patented August 13, 1902.]

2—390.

UNITED STATES OF AMERICA,  
DEPARTMENT OF THE INTERIOR,

United States Patent Office.

To all to whom these presents shall come, Greeting:

THIS IS TO CERTIFY that the annexed is a true copy from the Bound Volumes of the Library of this Office of the Complete Specification and Drawings in the matter of the

British Letters Patent to

Henry Fairbrother,

Dated August 13, 1902,

Number 17,786,

for

Improvements in Phonographs and other Talking  
Machines.

IN TESTIMONY WHEREOF I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the city of Washington, this 25th day of November, in the year of our Lord one thousand nine hundred and eleven, and of the Independence of the United States of America the one hundred and thirty-sixth.

[Seal]

F. A. TENNANT,  
Assistant Commissioner of Patents.





*Date of Application, 13th Aug., 1902—Accepted, 25th Sept., 1902*

## COMPLETE SPECIFICATION.

### Improvements in Phonographs and other Talking Machines.

I, HENRY FAIRBROTHER of 49 Kestrel Avenue, Herne Hill London S.E. Metal Trades' Valuer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

- 5 My invention relates to that class of talking machine in which the reproduction of sound is produced by attaching a stylus to a trumpet, said trumpet being vibrated direct by the stylus from the record which carries the sound writing. The principal features of the invention are the method of attaching the said stylus to the trumpet, the material of which the trumpet is formed the formation of a longitudinal rib on the trumpet practically normal to the side thereof, the method of supporting the trumpet and of forming the joints therein and also the addition to the said trumpet of an internal tongue to increase the vibration.

- 10 My trumpet may be of any suitable form but is preferably cone or funnel shaped and is provided with a flanged or bell shaped mouth. I form the trumpet chiefly or entirely of sonorous material such as gelatine, indurated fibre, celluloid, paper or the like and compose it of one or more sheets of the same. By preference I make it of two or three sheets and of different materials, said sheets being in the form of layers or folds which are stuck together by any suitable adhesive substance. For instance, I may use a sheet of gelatine or cellulose material, backed up with a sheet of fibrous material such as paper, or of a sheet of cellulose material and a sheet of gelatine material stuck together. The object in using more than one sheet is for cheapness of manufacture as well as to improve the tone, as a certain thickness is required to obtain good results. I therefore use a thin sheet of the more expensive material and get the required thickness of the trumpet by backing it up with cheaper material.

I employ several methods of forming the rib on the trumpet as well as several methods of attaching the stylus to the trumpet and also several methods of forming the trumpet from the sheet or sheets of material.

- 20 I will now describe my invention with reference to the accompanying drawings in which:—

- Fig. 1 shows an elevation of a cone-shaped trumpet partly in section, provided with a bell mouth which trumpet is constructed mainly of gelatine, indurated fibre, celluloid, paper or any other suitable sonorous material. By preference I form it from one sheet of material with a lap joint or turnover seam, longitudinally and glued or cemented together.

- This trumpet is fitted at its smaller end with a plug of suitable material such as wood, the end of which, projects outside and in which a hole is cut to receive a stylus which is preferably made of glass. The wood plug is preferably formed with a saw cut or split in order to give it a springy grip of the stylus. The wood plug is extended inside the trumpet in the shape of a thin flat tongue wider at its outer end to conform to the shape of the trumpet, to the walls of which it may be fastened if desired. This tongue greatly improves the reproductions but is not essential. If desired a small piece of cloth, leather or rubber may be held between the tongue and the wall of the trumpet where it is fastened or in contact to still further improve the reproduction. The tongue is shown split as this further increases its usefulness and allows it to vibrate more freely with the walls

of the trumpet. Instead of having a hole for the stylus, the plug may be provided with a point or pin over which a hollow stylus is fitted.

This drawing also shows one method which I adopt for supporting the trumpet from close under the bell shaped mouth.

Fig. 2. is a plan view of Fig. 1, the bell mouth and wide end of the trumpet not being shown. 9

Fig. 3 is a side elevation of another form of trumpet and shows a different method of attaching the stylus to the same. In this case a block of suitable material, such as wood, is inserted in the end of the trumpet and is centrally bored to receive the stylus which may be permanently or removably fixed therein. The drawing shows the stylus resting on a record of the usual cylindrical shape. 10

Fig. 4 shows a side elevation of a trumpet provided with a rib on its under side to which is attached the support of the trumpet and also a clip to hold the stylus.

Fig. 5 is an enlarged sectional view on the line *x* of the end of the trumpet and of the clip and stylus shown in Fig. 4. 15

Fig. 6 is a sectional view on the line *y* of the trumpet shown in Fig. 4 and

Fig. 7 is a sectional view on the line *z* of the trumpet shown in Fig. 4.

Fig. 8 shows a perspective view of a grooved block which I use by preference for the formation of the folded or pressed rib such as that shown in Fig. 6.

Fig. 9 is a sectional view of a part of the body of the trumpet and shows how I arrange the various sheets, in this case three in number, forming the same so that their joints overlap and do not come directly underneath or next to each other. 20

Fig. 10 is a view similar to Fig. 9 showing two sheets only.

Fig. 11 is a side elevation of a complete phonograph or talking machine showing the relative position of the parts, the means I adopt of supporting the trumpet from its smaller end and the method of attaching the stylus to the rib at about half way up the same. 25

Fig. 12 is a sectional view of the rib of a trumpet, such for instance as that shown in Fig. 11 and shows a U shaped cap which is clamped over the rib to strengthen it. 30

Fig. 13 is a plan view of the talking machine shown in Fig. 11.

Fig. 14 is a side elevation of a trumpet formed from one piece or strip of sonorous material which has been wound round a cone-shaped form to produce the desired shape, the edges of the said strip overlap each other so as to break joints. A double thimble or cap like clip is fitted to the end of the trumpet and also carries the stylus. The larger end of the trumpet rests on a double or universal joint to give free lateral and vertical movement and is supported by a swing rod. 35

Fig. 15 is a front view of the larger end of the trumpet shown in Fig. 14 and more clearly shows the joint by which the trumpet has free lateral or vertical movement. 40

Fig. 16 is a side elevation of a trumpet made from two strips of material which are wound round each other the joints overlapping so as to break the same. This trumpet is provided with a rib on its under side and is fitted with a cap at its smaller end to which the stylus is attached. 45

Fig. 17 is a section of the trumpet shown in Fig. 16 and shows a form of rib which is attached after the trumpet is made.

Fig. 18 represents a method of forming the trumpet with a rib which may be rivetted or cemented.

Fig. 19 is an end view of the same. 50

Referring to Figs. 1 and 2 *a* is the trumpet fitted with bell mouth *a*<sup>1</sup> and at its smaller end with plug *b*, to plug *b* is fitted or fixed the tongue *b*<sup>1</sup> which is split as shown and has rubber or other suitable material *c* at its ends. The other or outer end of the plug is formed in the shape of a ball and holds the stylus *s*, said ball being split or cut at *h* to improve the grip. 55

To the wider end of the trumpet is fitted a band *d* provided with lugs carrying joint *e* to which is attached an inverted bearing *g* for the bracket or swing rod *f*



*Fairbrother's Improvements in Phonographs and other Talking Machines.*

thus making a universal joint and giving free lateral and vertical movement to the trumpet.

Referring to Fig. 3. *a* is a trumpet of which the lower or narrower end only is shown, this end is fitted with plug *b* which is bored with a central hole *i* to which the stylus *s* is fitted. The stylus *s* is shown resting on the record *w*.

Referring to Figs. 4, 5, 6 and 7 *a* is the trumpet fitted with bell mouth *a*<sup>1</sup> and rib *k* the upper part of which, *k*<sup>1</sup> has been folded or turned back against the trumpet *a*, to allow the bell shaped mouth *a*<sup>1</sup> to pass over it. To the lower end of rib *k* is fitted clip *l* made of any suitable material which carries the stylus *s*. The stylus is preferably removable being pushed into a slot *l*<sup>1</sup> in the clip *l*. The stylus rests on the record or sound writing by gravity or spring tension.

Referring to Fig. 8. The block *p* is grooved as shown at *p*<sup>1</sup>, this is used to hold the folded or turned edges forming the rib *k* when made until the adhesive substance used in them has become hard or set.

In Figs. 9 and 10. the separate layers of material *a*, *a*<sup>1</sup> and *a*<sup>2</sup> may be formed of different material, for instance *a* may be gelatine *a*<sup>1</sup> may be paper and *a*<sup>2</sup> may be of gelatine or any other suitable material. The ends or edges *j* of these separate materials do not lie directly over one another or in the same line.

Referring to Figs. 11 and 13, the trumpet *a* is formed with a joint or rib *k* shown in cross section in Fig. 12, which joint is covered with a U shaped cap *q* which fits closely over the rib and holds the joint securely. This trumpet is hung from the small end and the stylus *s* is attached to the rib at a point *l* some distance from the smaller end of the trumpet. The rod *o* is fastened to the trumpet at *o*<sup>1</sup> which is hinged at *o*<sup>2</sup> to allow a free vertical movement about *o*<sup>2</sup> as a centre, the vertical rod *o*<sup>3</sup> is also pivotted at *o*<sup>2</sup> and rests loosely in the standard *a*<sup>4</sup> so as to allow a free lateral movement about *o*<sup>4</sup> as a centre. This standard is fixed to the base of the machine. The stylus *s* rests in the record by gravity and traverses the spiral sound writing of the record as it rotates. The record *w* may be turned by a suitable handle such as *w*<sup>1</sup> or it may be turned by clockwork or other suitable means.

Referring to Figs. 14 and 15. *a* is the trumpet formed spirally from a strip of material. At the lower end of the trumpet is fitted the double cap or thimble *r* one end of which embraces the trumpet and the other holds the stylus *s*.

To the wider end of the trumpet is attached a plate *t* formed with a lug *v* to which is jointed an inverted bearing *g* in which the swing rod *o* is free to work.

Referring to Fig. 16 the trumpet is formed from two strips *a*<sup>1</sup> and *a*<sup>2</sup> of material wound one over the other so as to break joints, the rib *k* may be attached afterwards as shown at *k* in Fig. 17.

Figs. 18 and 19 show another form in which I may make my trumpet, in this case the edges of the material are turned out and rivetted together as shown at *v* and a clip *l* is attached thereto to hold the stylus *s*.

I do not confine myself to any particular form or shape of the plug or of the tongue and the trumpet may be round, oval or any other suitable cross section.

In any of the above trumpets a single sheet or a sheet composed of more than one sheet of different materials stuck together may be used.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is:—

1. A trumpet for phonographs or talking machines formed mainly of a sheet of sonorous material of a conical or pyramidal shape with a plug for attaching stylus fitted in its smaller end, said plug terminating in a vibratory tongue or plate, fitted to the inside of the trumpet, substantially as herein described and set forth.

2. A trumpet for phonographs or talking machines formed mainly of a sheet of sonorous material of conical or pyramidal shape with a plug for attaching stylus fitted in its smaller end, said plug terminating in a vibratory tongue or plate

fitted to the inside of the trumpet said tongue having a longitudinal slit to increase vibration, substantially as herein described and set forth.

3. A trumpet for phonographs or talking machines constructed mainly of a sheet of sonorous material and means for attaching the stylus by a plug in small end of trumpet with a hole in outer end of said plug for receiving the stylus, 5 substantially as herein described and set forth.

4. A trumpet for phonographs or talking machines constructed mainly of a sheet of sonorous material and means for attaching the stylus by a plug in small end of trumpet with hole in outer end of said plug for receiving the said stylus, said plug being slitted or cut as shown at Fig. 2 for the purpose of gripping said 10 stylus, substantially as herein described and set forth.

5. A trumpet for phonographs or talking machines constructed mainly of a sheet of sonorous material joined together by lap folded joints, cemented or glued, and means for attaching stylus, thereto substantially as herein described and 15 set forth.

6. A trumpet for phonographs or talking machines fitted with a stylus said trumpet being formed of layers or sheets of different sonorous material stuck together substantially as herein described and set forth.

7. A trumpet for phonographs or talking machines fitted with a stylus, said trumpet being formed of one or more sheets of sonorous or resonant material with 20 a seam or longitudinal joint, such as described in various figures of drawings hereto annexed and substantially as herein of drawings hereto annexed and substantially as herein described and set forth.

8. A trumpet for phonographs or talking machines with a normal projecting rib and a stylus attached thereto, substantially as herein described and set forth. 25

9. The methods of attaching the stylus to the trumpet substantially as herein described.

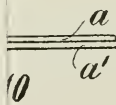
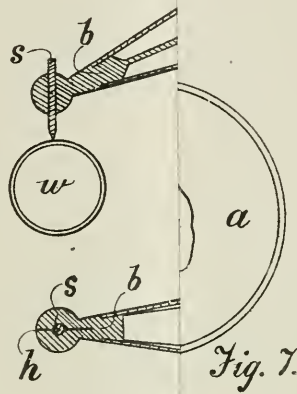
10. A trumpet formed by winding two layers of strip material, as shown in Fig. 15 herein and a stylus attached thereto substantially as herein described.

11. A trumpet formed by winding one strip of material with the edges overlapping into a cone or funnel shape substantially as herein described and as 30 shown in Fig. 14 of the annexed drawings.

Dated this 13th. day of August 1902

HY. FAIRBROTHER.  
33 Cannon St London. E.C. 35





[This Drawing is a reproduction of the Original on a reduced scale.]



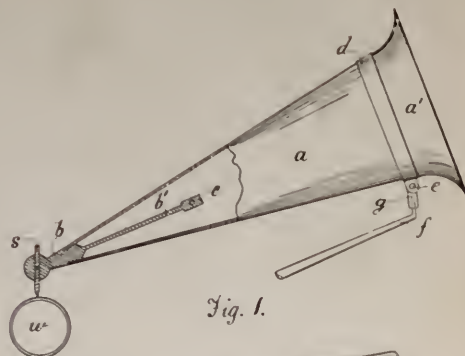


Fig. 1.

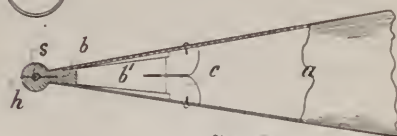


Fig. 2.

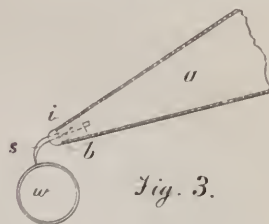


Fig. 3.

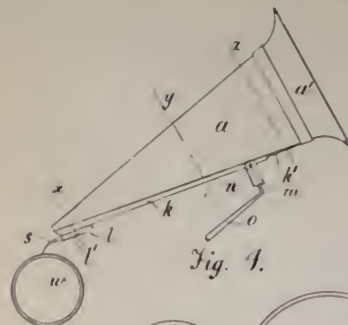


Fig. 4.



Fig. 5.

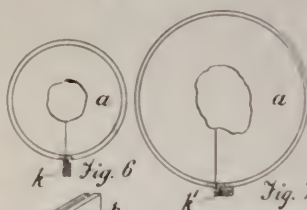


Fig. 6.

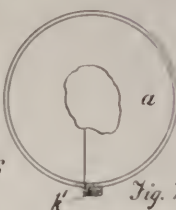


Fig. 7.

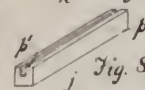


Fig. 8.

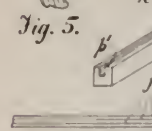


Fig. 9.



Fig. 10.

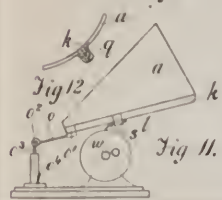


Fig. 11.

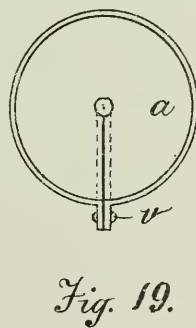
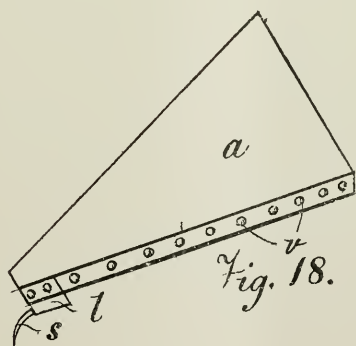
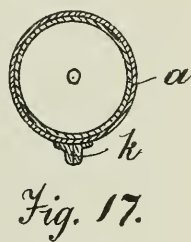
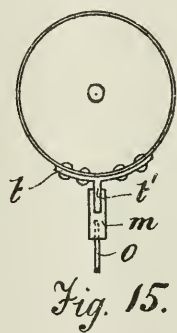
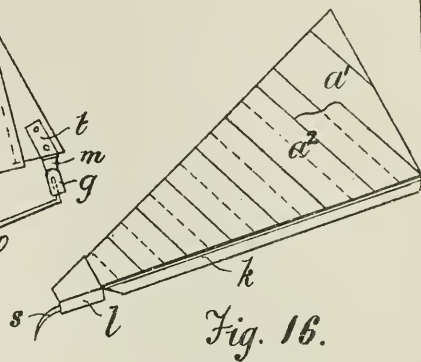
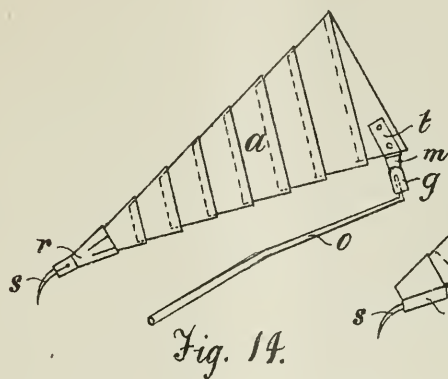


Fig. 12.



Fig. 13.





[This Drawing is a reproduction of the Original on a reduced scale].







[Endorsed]: No. 15,326. U. S. Dist. Court, Nor. Dist. of Cal. Dfts. Exhibit "R." Oct. 2, '12. W. B. M., Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit "R." Received Aug. 19, 1913. F. D. Monckton, Clerk.

[Defendant's Exhibit "S"—Letters Patent No. 771,441, to Peter C. Nielsen, Patented October 4, 1904.]

2—390.

UNITED STATES OF AMERICA,  
DEPARTMENT OF THE INTERIOR,

United States Patent Office.

To all to whom these presents shall come, Greeting:

THIS IS TO CERTIFY that the annexed is a true copy from the Records of this Office of the File Wrapper and Contents in the matter of the

Letters Patent of  
Peter C. Nielsen,

Number 771,441,                      Granted October 4, 1904,  
for

Improvement in Horns for Phonographs or Similar  
Machines.

IN TESTIMONY WHEREOF I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this 29th day of May, in the year of our Lord one thousand nine hundred and eleven, and of the Independence of the United States of America the one hundred and thirty-fifth.

[Seal]

F. A. TENNANT,  
Assistant Commissioner of Patents.

2—437.

NUMBER (SERIES OF 1900).

203,080

1904

DIV. 23

(EX'R'S BOOK). 114

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9(04)

PATENT No. 771,441.

Name—Peter C. Nielsen

Of Greenpoint.

County of

State of New York.

Invention—Horn for Phonographs and Similar Machines.

Division of App., No. , filed , 190 PARTS OF APPLICATION FILED.	ORIGINAL.		RENEWED.
	Petition	Apr. 14, 1904	, 190
	Affidavit	“ “, 1904	, 190
	Specification	“ “, 1904	, 190
	Drawing	“ “, 1904	, 190
	Model or Specimen not reqd.	, 190	, 190
	First Fee Cash \$15.00	Apr. 14, 1904	, 190
	“ “ Cert.	, 190	, 190
	Appl. filed complete	Apr. 14, 1904	, 190

Examined—J. T. Newton,

Ex. Sept. 2, 1904 , 190

Countersigned—R. E. Grant, , 190

For Commissioner. For Commissioner.

9-3-04.

Notice of Allowance Sept. 3, 1904 , 190

Final Fee Cash \$20 Sept. 12, 1904 , 190

“ “ Cert. , 190 , 190

2

Patented October 4 , 1904

*Searchlight Horn Company.*

89

Attorney—EDGAR TATE & CO.,

245 Broadway,

New York City.

Associate Attorney—WM. N. CROMWELL,

1003 F. St., N. W.,

City.

Name

Serial Number

Patent No.

Date of Patent.

3

No. 203080 No. 1/2

filed

Apl. 14/04.

\$15—RECEIVED

Apr. 14, 1904. ck

CHIEF CLERK, U. S. PATENT OFFICE.

245 Broadway, New York.

April 13, 1904.

Hon. Commissioner of Patents,

Washington, D. C.

Sir:—

We beg to enclose herewith application of Peter C. Nielsen for Letters Patent for Horns for Phonographs and Similar Machines, together with check for \$15, the Government filing fee thereon.

Very respectfully,

EDGAR TATE & CO.

# APPLICATION FOR LETTERS PATENT OF THE UNITED STATES.

MAIL ROOM.	No. 203080.	No. 1/2.
APR. 14, 1904.		Appl'n filed
U. S. PATENT OFFICE.		Apl. 14/04.

## PETITION.

To the Commissioner of Patents:

Your petitioner, PETER C. NIELSEN, a citizen of the United States and residing at Greenpoint in the County of Kings and State of New York and having a post-office address at 23 Drake Ave., Greenpoint, Brooklyn, N. Y., prays that Letters Patent may be granted to him for the improvements in HORNS FOR PHONOGRAPHS AND SIMILAR MACHINES set forth in the annexed specification; and he hereby appoints Edgar Tate and William W. Canfield of the firm of EDGAR TATE & CO., 245 Broadway, New York, or their accredited agent to act as his attorneys to prosecute this application, with power to make alterations and amendments therein, to sign the drawings, to receive the patent, and to transact all business in the Patent Office connected therewith.

PETER C. NIELSEN.

## SPECIFICATION.

To all whom it may Concern:

Be it known that I, PETER C. NIELSEN, a citizen of the United States ~~and~~ residing at Greenpoint in the County of Kings and State of New York have invented certain new and useful improvements in HORNS FOR PHONOGRAPHS ~~AND~~ SIMILAR  
OR

MACHINES of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to the horn of a phonograph or other machine of this class and the object thereof is to provide a horn for machines of this class which will do away with the mechanical, vibratory, and metallic sound usually produced in the *operation* such machines, and also produce a full, even and continuous volume of sound in which the articulation is clear, full and distinct.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:—

Fig. 1 is a side view of my improved phonograph horn;

Fig. 2 an end view thereof;

Fig. 3 an enlarged section on the line 3-3 of Fig. 1; and

Fig. 4 a longitudinal section on the line 4-4 of Fig. 3.

In the practice of my invention, I provide a horn *a* provided at its smaller end with the usual nozzle piece *a2* by means of which connection is made with the machine, and in the form of construction shown a supplemental piece *a3* is employed between the larger or body portion of the horn and the nozzle piece *a2*, but the parts *a3* and *a2* may be formed integrally if desired, and may be constructed in any desired manner.



The main part *a* of the horn is bell-shaped in form and tapers outwardly gradually from the part *a3* to the larger or mouth end *a4*, and this curve or taper is greater or more abrupt adjacent to said larger or mouth end.

The body portion of the horn is also composed of a plurality of longitudinal strips *b* which are gradually tapered from one end to the other and which are connected longitudinally so as to form longitudinal ribs *b2*, each of the strips *b* being provided at its opposite edges with a flange *b3*, and these flanges, of the separate strips *b*, are connected to form the ribs *b2*.

The body portion of the horn, or the strips *b* are composed of sheet metal, and it will be observed that the inner wall of the body portion of said horn in cross section is made up of a plurality of short lines forming, substantially, a circle, and it is the construction of the body portion of the horn as hereinbefore described, that gives thereto the qualities which it is the objects of this invention to produce, which objects are the result of the formation of the horn, or the body portion thereof of longitudinal strips *b*, and providing the outer surface thereof with the longitudinal ribs *b2*, and curving the body portion of the horn in the manner described.

If desired, the part *a3* may be formed integrally with the body portion of the horn, in which event the ribs *b2* would extend to the nozzle or connecting portion *a2*, and it is the longitudinal ribs *b2* which contribute mostly to the successful operation of the horn, said rib serving to do away with the vibratory



character of horns of this class as usually made and doing away with the metallic sound produced in the operation thereof.

My improved horn may be used in connection with phonographs, or other machines of this class, and changes in and modifications of the construction described may be made without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A horn for phonographs and similar machines, the body portion of which is composed of longitudinally arranged strips of metal provided at their edges with longitudinal outwardly directed flanges whereby said strips are connected and whereby, the body portion of the horn is provided on the outside thereof with longitudinally arranged ribs, substantially as shown and described.

2. A horn for phonographs and similar machines, the body portion of which is composed of longitudinally arranged strips of metal provided at their edges with longitudinal outwardly directed flanges whereby said strips are connected and whereby, the body portion of the horn is provided on the outside thereof with longitudinally arranged ribs, said strips being tapered from one end of said horn to the other, substantially as shown and described.

8/26/04

~~3. A horn for phonographs and similar machines, said horn being tapered in the usual manner and the body thereof on the outer side thereof being provided with longitudinally arranged ribs, substantially as shown and described.~~

Insert A

IN TESTIMONY that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 13th day of April, 1904.

PETER C. NIELSEN.

Witnesses:

F. A. STEWART.

C. J. KLEIN.

OATH.

STATE OF NEW YORK,  
COUNTY OF NEW YORK,—ss.

PETER C. NIELSEN the above named petitioner, being duly sworn, deposes and says that he is a citizen of the United States and resident of Greenpoint in the County of Kings and State of New York; that he verily believes himself to be the original, first and sole inventor of the improvements in HORNS FOR PHONOGRAPHS AND SIMILAR MACHINES described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used prior to his invention thereof, or patented or described in any printed publication in the United States of America or any country foreign thereto before his invention thereof, or more than two years prior to this appli-

eration, or in public use or on sale in the United States for more than two years prior to this application; and that no application for a patent has been filed by him or his legal representatives or assigns in any country foreign to the United States.

PETER C. NIELSEN.

Sworn to and subscribed before me this 13th day of April, 1904.

[Notarial Seal]

W. W. CANFIELD,  
Notary Public.

2—260

Div. 23—Room 379.

Paper No, 1, Rejection.

Address only

All communications respecting this

"The Commissioner of Patents,  
Washington, D. C."

application should give the serial  
number, date of filing, and title of  
invention.

J. H. D.

DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE.

WASHINGTON, D. C., May 13, 1904.

MAILED

" " "

Peter C. Nielsen,

Care Edgar Tate & Co.,

#245 Broadway,

New York, N. Y.

Please find below a communication from the EX-AMINER in charge of your application for Horn for Phonographs & Similar Machines, filed April 14, 1904, Serial number 203,080.

F. I. ALLEN,

~~F. B. MOORE,~~

Commissioner of Patents.

Claim 3 of this application is rejected in view of Tourtel's Eng. Pat. #20,557 of 1902, Graphophones, and U. S. Patent of Fallows, Aug. 15, 1876, #181,159, Games and Toys, Toys, Sounding, it being held that it would not constitute patentable invention to provide a horn with longitudinal ribs, in view of the transverse ribs of Fallow's and the longitudinal rib of Tourtel.

J. T. NEWTON,

Ex.

J. H. L.

No. 2

Amdt. A.

MAIL ROOM.

C. 6/7/04.

JUN. 7, 1904.

U. S. PATENT OFFICE.

IN THE UNITED STATES PATENT OFFICE.

Room #379.

In re Application of Peter C. Nielsen, Horn for  
Phonographs and Similar Machines.

Filed April 14, 1904. Ser. #203,080.

To the Commissioner of Patents,

Sir:—

We desire to amend the above entitled case as follows:—

Add the following claim.

8/26/04

4. A horn for phonographs and similar machines, said horn being tapered in the usual manner and the body thereof on the outer side thereof being provided with longitudinally arranged ribs between which the longitudinal parts of the horn taper from one end to the other, substantially as shown and described.

Insert B

REMARKS.

This amendment is made in view of the Official communication of May 13. The references cited in this cases do not show a horn for talking machines having longitudinally arranged ribs on the outer side thereof. One of the references cited shows spirally arranged ribs, but this in no sense anticipates applicant's invention. This arrangement of the ribs would make the horn vibrate more and cause more of a metallic sound than if no ribs at all were formed on it. It is the longitudinally arranged ribs on the outer side of the horn which produce the result claimed by applicant, and favorable action is respectfully requested.

Respectfully submitted,

EDGAR TATE & CO.,

Attorneys for Applicant.

Dated New York, June 6, 1904.

2—260

Div. 23—Room 379.

Paper No. 3, Rej.

Address only

All communications respecting this

"The Commissioner of Patents,  
Washington, D. C."

application should give the serial  
number, date of filing, and title of  
invention.

J. H. D.

DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE.

WASHINGTON, D. C., June 22, 1904.

MAILED

" " "

Peter C. Nielsen,

Care Edgar Tate & Co.,

#245 Broadway,

New York, N. Y.

Please find below a communication from the EX-



AMINER in charge of your application for Horn for Phonographs and Similar Machines, filed April 14, 1904, serial number 203,080.

F. I. ALLEN,

~~E. B. MOORE,~~

Commissioner of Patents.

This action is in response to the amendment filed the 7th instant.

Claims 3 and 4 are rejected in view of the patent of Clayton, Oct. 18, 1898, #612,639 (181-25), the part "A" in said patent being considered the equivalent of applicant's horn as defined in claims 3 and 4 though said part "A" be more flaring than applicant's horn.

J. T. NEWTON,

Ex.

J. H. L.

No. 4.

MAIL ROOM.

Amdt. B.

JUN. 22, 1904.

6/22/04.

U. S. PATENT OFFICE.

IN THE UNITED STATES PATENT OFFICE.

Room 379.

In the Matter of the Application of Peter C. Nielsen,  
Horn for Phonographs and Similar Machines,  
Filed April 14, 1904. Ser. No. 203,080.

Hon. Commissioner of Patents,  
Washington, D. C.

Sir:—

We desire to amend the above-entitled case as follows:—

Add the following claim:—

5. A horn for phonographic and similar instruments, said  
horn being larger at one end than at the other and being composed  
of longitudinal tapered strips which are secured together at their  
edges substantially as shown and described.

REMARKS.

This amendment is supplemental to that dated  
June 6th, 1904, and it is respectfully requested that  
said amendment be entered and the case considered  
in view thereof.

Respectfully submitted,  
EDGAR TATE & CO.,  
Attorneys for Applicant.

Dated New York, June 21, 1904.

No. 5

MAIL ROOM.

Amdt—C. K.

JUN. 29, 1904.

6/29/04

U. S. PATENT OFFICE.

IN THE UNITED STATES PATENT OFFICE.

Room #379.

In re Application of Peter C. Nielsen, Horn for  
Phonographs and Similar Instruments.

Filed April 14, 1904. Ser. No. 203,080.

To the Commissioner of Patents,

Sir:—

We desire to amend the above entitled case as  
follows:—

Add the following claim.

3 &. A horn for phonographs and similar instru-  
ments, said horn being larger at one end than at  
the other and tapered in the usual manner,  
C. said horn being composed of longitudinally



arranged strips secured together at their edges and the outer side thereof at the points where said strips are secured together being provided with longitudinal ribs, substantially as shown and described.

---

REMARKS.

This amendment is made in view of the Official communication of June 22nd. We have carefully considered Clayton the new reference cited and we do not see any similarity therein to applicant's device either in construction or operation. The object of applicant's construction is to destroy the vibratory character of a phonographic horn, and this cannot be done by corrugating the horn as all forms of corrugations increase the vibration instead of diminishing it. This fact ought to be apparent on its face and there is nothing in the references that meets claims 3 and 4 and favorable action thereon as well as on claims 6 presented herewith is requested.

Respectfully submitted,

EDGAR TATE & CO.,

Attorneys for Applicant.

Dated New York, June 28, 1904.

2—260

Div. 23—Room 379.

Paper No. 6. Rej.

Address only

All communications respecting this

“The Commissioner of Patents,  
Washington, D. C.”

application should give the serial  
number, date of filing, and title of  
invention.

J. H. D.

DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE.

WASHINGTON, D. C., July 21, 1904.

MAILED

“ “ “

Peter C. Nielsen,

Care Edgar Tate & Co.,

#245 Broadway,

New York, N. Y.

Please find below a communication from the EX-AMINER in charge of your application for Horn for Phonographs and Similar Machines, filed April 14, 1904, serial number 203,080.

F. I. ALLEN,

~~E. B. MOORE,~~

Commissioner of Patents.

This action is in response to the amendments filed the 22nd and 29th instants.

It is believed that it cannot constitute patentable invention to provide any horn with longitudinal stiffening ribs to render the horn perhaps less vibratory. Claims 3, 4 and 5 are held to be devoid of patentable novelty and invention in view of this holding and the prior art exhibited by the patents cited and the



2-260

Div. 23—Room 379.

Paper No. 8.

Address only

All communications respecting this

"The Commissioner of Patents,  
Washington, D. C."

application should give the serial  
number, date of filing, and title of  
invention.

M. E. P.

DEPARTMENT OF THE INTERIOR.

UNITED STATES PATENT OFFICE.

WASHINGTON, D. C., August 5, 1904.

Peter C. Nielsen,

c/o Edgar Tate & Co.,  
New York City.

Mailed Aug. 5/04

Please find below a communication from the EX-  
AMINER in charge of your application, Serial No.  
203,080, filed April 14, 1904, for Horn for Phono-  
graphs and Similar Machines.

F. I. ALLEN,

~~E. B. MOORE,~~

Commissioner of Patents.

This action is responsive to letter filed the 27th  
ultimo.

Claims 3 and 4 are rejected in view of the holding  
that it cannot constitute patentable invention to  
provide any horn with longitudinal stiffening ribs  
to render the horn perhaps less vibratory. These  
claims and claim 5 are rejected also in view of the  
patents cited and the patent of Osten et al. referred  
to in the last action.

J. T. NEWTON,

Ex.

J. H. L.

U. S. PATENT OFFICE.

RECEIVED.

AUG. 17, 1904.

DIVISION 23.

IN THE UNITED STATES PATENT OFFICE.

Room 379.

In the Matter of the Application of Peter C. Nielsen,  
Horn for Phonographs and Similar Machines,  
Filed April 14, 1904, Ser. No. 203,080.

Hon. Commissioner of Patents,  
Washington, D. C.

Sir:—

We hereby appoint William N. Cromwell, 1003 F  
Street, N. W., Washington, D. C., our associate at-  
torney in the above entitled case.

Respectfully submitted,

EDGAR TATE & CO.,

Attorneys for Applicant.

Dated New York, Aug. 16, 1904.

No. 10.

U. S. PATENT OFFICE.

Amdt.

RECEIVED

AUG. 26, 1904.

DIVISION 23.

IN THE UNITED STATES PATENT OFFICE.

In re Application of PETER C. NIELSEN, Horn  
for Phonographs, and Similar Machines.

Filed April 14, 1904, Serial No. 203,080.

Before the Examiner, Room 379.

HON. COMMISSIONER OF PATENTS,

Sir:—

The above-entitled application is hereby amended

as follows:—

Cancel claims 3, 4 and 5.

REMARKS.

The above amendment places this case in condition for allowance, and such action is respectfully requested at an early date.

Very respectfully,  
W. N. CROMWELL,  
Associate Attorney.

2—181.

A. R. Issue Division.

Serial No. 203,080.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

DEPARTMENT OF THE INTERIOR,  
U. S. PATENT OFFICE,

Washington, D. C., Sept. 3, 1904.

Peter C. Nielsen,  
c/o W. N. Cromwell,  
City.

Sir:—Your APPLICATION for a patent for an IMPROVEMENT IN Horn for Phonographs and Similar Machines, Filed April 14, 1904, has been examined and ALLOWED.

The final fee, Twenty Dollars, must be paid, and the Letters Patent bear date as of a day not later than SIX MONTHS from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be

If payment is made by check or draft, the credit allowed is subject to the collection of the same.



by a renewal of the application, with additional fees, under the provisions of Section 4897, Revised Statutes. The Office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least TWENTY DAYS prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, **DISTINCTLY AND PLAINLY WRITTEN**, the name of the **INVENTOR** and **TITLE OF INVENTION AS ABOVE GIVEN**, **DATE OF ALLOWANCE** (which is the date of this circular), **DATE OF FILING**, and, if assigned, the **NAMES OF THE ASSIGNEES**.

If you desire to have the patent issue to **ASSIGNEES**, an assignment containing a **REQUEST** to that effect, together with the **FEE** for recording the same, must be filed in this Office on or before the date of payment of final fee.

After issue of the patent uncertified copies of the drawings and specifications may be purchased at the price of 5 cents each. The money should accompany the order. Postage stamps will not be received.

Respectfully,

F. I. ALLEN,

Commissioner of Patents.



After allowance, and prior to payment of the final fee, applicants should carefully scrutinize the description to see that their statements and language are correct, as mistakes not incurred through the fault of the office, and not affording legal grounds for reissues, will not be corrected after the delivery of the letters patent to the patentee or his agent.

245 Broadway, New York.

\$20 RECEIVED.

ck. SEP. 12, 1904. z

CHIEF CLERK, U. S. PATENT OFFICE.

Sept. 10, 1904.

Hon. Commissioner of Patents,  
Washington, D. C.

Sir:—

We beg to enclose herewith our check for \$20 final Government fee in the matter of the application of Peter C. Nielsen Phonograph Horn, filed April 14, 1904, Ser. No. 203,080, Allowed Sept. 3, 1904, and beg to request that the patent be duly issued.

Very respectfully,

EDGAR TATE & CO.

C. E. R.

2—191.

ISSUE DIVISION.

Serial No. 203,080.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

DEPARTMENT OF THE INTERIOR,  
UNITED STATES PATENT OFFICE,  
Washington, D. C., Sept. 12, 1904.

Peter C. Nielsen,  
c/o Edgar Tate & Co.,  
245 Broadway,  
New York, N. Y.

Sir:—

You are informed that the final fee of TWENTY DOLLARS has been received in your application for Improvement in

Horn for Phonographs and Similar Machines.

Very respectfully,

F. I. ALLEN,

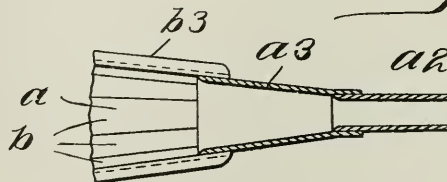
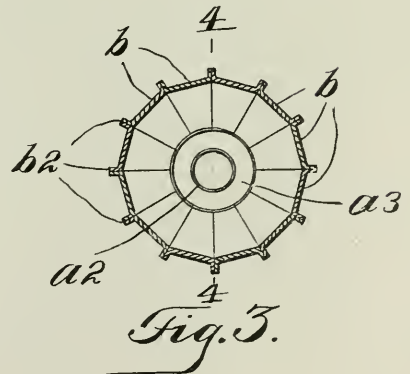
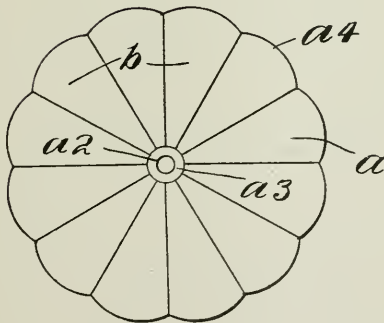
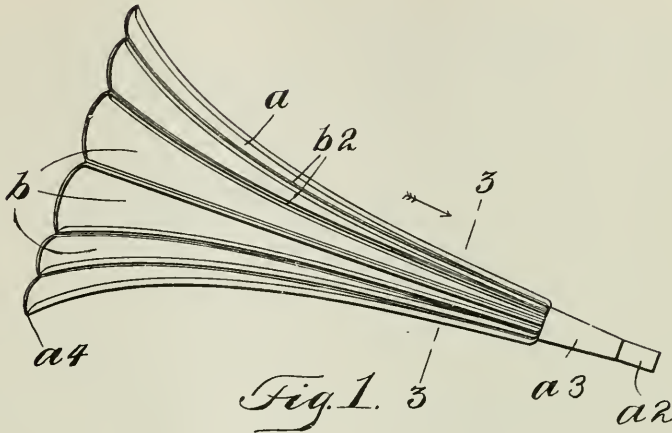
~~E. B. MOORE,~~

Commissioner of Patents.

P. C. NIELSEN.  
HORN FOR PHONOGRAPHS OR SIMILAR MACHINES.

APPLICATION FILED APR. 14, 1904.

NO MODEL.



WITNESSES

*W. B. Shattlingly*  
*F. A. Stewart*

*Fig. 4.*

BY

INVENTOR  
*Peter C. Nielsen,*  
*Edgar Tate & Co*  
ATTORNEYS



PETER C. NIELSEN, OF GREENPOINT, NEW YORK.

## HORN FOR PHONOGRAPHS OR SIMILAR MACHINES.

SPECIFICATION forming part of Letters Patent No. 771,441, dated October 4, 1904.

Application filed April 14, 1904. Serial No. 203,080. (No model.)

*To all whom it may concern:*

Be it known that I, PETER C. NIELSEN, a citizen of the United States, residing at Greenpoint, in the county of Kings and State of New York, have invented certain new and useful Improvements in Horns for Phonographs or Similar Machines, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to the horn of a phonograph or other machine of this class; and the object thereof is to provide a horn for machines of this class which will do away with the mechanical, vibratory, and metallic sound usually produced in the operation of such machines, and also produce a full, even, and continuous volume of sound in which the articulation is clear, full, and distinct.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which—

Figure 1 is a side view of my improved phonograph-horn; Fig. 2, an end view thereof; Fig. 3, an enlarged section on the line 3 3 of Fig. 1, and Fig. 4 a longitudinal section on the line 4 4 of Fig. 3.

In the practice of my invention I provide a horn *a*, provided at its smaller end with the usual nozzle-piece *a*<sup>1</sup>, by means of which connection is made with the machine, and in the form of construction shown a supplemental piece *a*<sup>3</sup> is employed between the larger or body portion of the horn and the nozzle-piece *a*<sup>1</sup>; but the parts *a*<sup>3</sup> and *a*<sup>2</sup> may be formed integrally, if desired, and may be constructed in any desired manner. The main part *a* of the horn is bell-shaped in form and tapers outwardly gradually from the part *a*<sup>3</sup> to the larger or mouth end *a*<sup>4</sup>, and this curve or taper is greater or more abrupt adjacent to said larger or mouth end. The body portion of the horn is also composed of a plurality of longitudinal strips *b*, which are gradually tapered from one end to the other, and which are connected longitudinally, so as to form longitudinal ribs *b*<sup>2</sup>, each of the strips *b* being provided at

its opposite edges with a flange *b*<sup>1</sup>, and these flanges of the separate strips *b* are connected to form the ribs *b*<sup>2</sup>. The body portion of the horn or the strips *b* are composed of sheet metal, and it will be observed that the inner wall of the body portion of said horn in cross-section is made up of a plurality of short lines forming substantially a circle; and it is the construction of the body portion of the horn as hereinbefore described that gives thereto the qualities which it is the objects of this invention to produce, which objects are the result of the formation of the horn or the body portion thereof of longitudinal strips *b* and providing the outer surface thereof with the longitudinal ribs *b*<sup>2</sup> and curving the body portion of the horn in the manner described. If desired, the part *a*<sup>3</sup> may be formed integrally with the body portion of the horn, in which event the ribs *b*<sup>2</sup> would extend to the nozzle or connecting portion *a*<sup>1</sup>, and it is the longitudinal ribs *b*<sup>2</sup> which contribute mostly to the successful operation of the horn, said ribs serving to do away with the vibratory character of horns of this class as usually made and doing away with the metallic sound produced in the operation thereof.

My improved horn may be used in connection with phonographs or other machines of this class, and changes in and modifications of the construction described may be made without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A horn for phonographs and similar machines, the body portion of which is composed of longitudinally-arranged strips of metal provided at their edges with longitudinal outwardly-directed flanges whereby said strips are connected and whereby, the body portion of the horn is provided on the outside thereof with longitudinally-arranged ribs, substantially as shown and described.

2. A horn for phonographs and similar machines, the body portion of which is composed of longitudinally-arranged strips of metal provided at their edges with longitudinal outwardly-directed flanges whereby said strips

are connected and whereby, the body portion of the horn is provided on the outside thereof with longitudinally-arranged ribs, said strips being tapered from one end of said horn to the  
5 other, substantially as shown and described.

3. A horn for phonographs and similar instruments, said horn being larger at one end than at the other and tapered in the usual manner, said horn being composed of longitudinally-arranged strips secured together at  
10 their edges and the outer side thereof at the

points where said strips are secured together being provided with longitudinal ribs, substantially as shown and described.

In testimony that I claim the foregoing as  
15 my invention I have signed my name, in presence of the subscribing witnesses, this 13th day of April, 1904.

PETER C. NIELSEN.

Witnesses:

F. A. STEWART,  
C. J. KLEIN.



[In pencil]:  
Acoustics  
Megaphones.

1904.

CONTENTS:

Print

- $\frac{1}{2}$  Application 1 papers.
1. Rej. May 13/04.
  2. Amdt. A. June 7/04.
  3. Rej. June 22/04.
  4. Amdt. B. June 22/04.
  5. Amdt. C. June 29/04.
  6. Rej. July 21/04.
  7. Argument July 27/04.
  8. Rej. Aug. 5/04.
  9. Asso-Power Aug. 17/04.
  10. Amdt. Aug. 26/04.
  - 11.
  - 12.
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TITLE:

Improvement in Horn for

or

Phonographs ~~and~~ Similar Machines.

[Endorsed]: No. 15326. U. S. Dist. Court, Nor.  
Dist. of Cal. Dfts. Exhibit "S." Oct. 2, '12. M.,  
Deputy Clerk.

No. 2306. U. S. Circuit Court of Appeals for  
the Ninth Circuit. Defendant's Exhibit "S." Re-  
ceived Aug. 19, 1913. F. D. Monckton, Clerk.